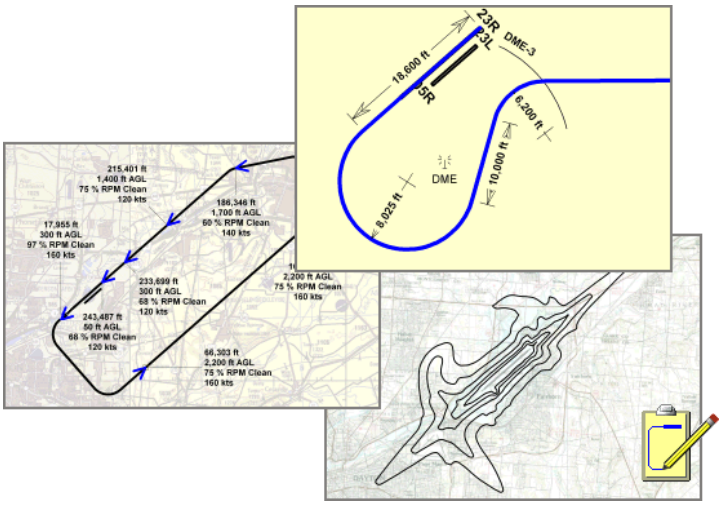
BaseOps 7.365 User's Guide



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WASMER CONSULTING

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Chapter 1

Introduction

1.1. What is BaseOps?

BaseOps is a graphical user interface for the Noisemap suite of aircraft noise models. This Microsoft Windows application guides you through the steps in performing an airport noise analysis: entering the aircraft operational data, running the noise models, and creating noise contours using NMPlot.

The Noisemap suite of noise models includes:

- AAM, the Advanced Acoustical Model, the next-generation model of aircraft flight noise developed jointly by the US Department of Defense and NASA
- NMap, the US Department of Defense's model of aircraft flight and run-up noise near air bases
- MRNMap, the US Department of Defense's model of subsonic aircraft noise from Military Operations Area (MOA) and Military Training Route (MTR) operations
- AGM, the US Department of Defense's model of noise from airborne weaponry operations
- RNM, the Rotorcraft Noise Model, NASA Langley's model of helicopter and tilt-wing aircraft noise

1.2. What Can BaseOps Do?

Using BaseOps, you can:

- Edit all data associated with a noise analysis case, including runways, flight tracks, flight profiles, and static profiles

- Display and edit noise analysis data using both text-based forms and graphical maps
- Open and import select data from BaseOps `.baseops` files, NMap `.bps` files, NMap/AAM/RNM `.ops/.opx` operations files, and MRNMap `.inp/.ins/.inx` input files
- Import information from Integrated Noise Model (INM) cases
- Import information from DAFIF (Defense Aeronautical Flight Information File)
- Export/Import flight and static profile data to/from Microsoft Excel
- Check a noise analysis case for errors
- Create scenarios, which represent alternate noise analysis cases created by modifying an existing case (for example, increasing all F-16 operations by 50% over the baseline case)
- Import elevation and ground cover data from numerous sources, and create the elevation and ground impedance files used by the noise models
- Run Omega10 and Omega11 (the United States Department of Defense's models for extrapolating measured noise data) and create Noisemap OPX files
- Run the NMap, AAM, AGM, MRNMap, and RNM noise models
- Create noise contours using the NMPlot plotting application
- Create customized reports that can include tables and maps
- Maintain a history of the major events that occur while editing a noise analysis case
- Display background maps stored in any of the following formats:
    - ARC/INFO Shapefile (SHP)
    - Digital Line Graph (DLG)
    - AutoCAD Data Exchange Format (DXF)
    - Georeferenced Bitmap (BMP, TIF, JPG, PNG)
    - Slippy Map
    - Compressed ARC Digitized Raster Graphics (CADRG)

- Export maps to either the clipboard or bitmap image files

1.3. Assumptions About Users

It is assumed that you are familiar with the terms and concepts necessary to use the Noisemap suite of aircraft noise models. The BaseOps User's Guide is not a manual for conducting a noise analysis; its scope is limited to BaseOps' role as a tool in the noise analysis process.

1.4. Distribution License

BaseOps is distributed as acknowledgement-ware: it may be freely used and distributed, provided that Wasmer Consulting is acknowledged as the author.

Chapter 2

Getting Started

2.1. Minimum System Requirements

To take full advantage of BaseOps, your computer should meet the following minimum requirements.

- *Operating System* - Microsoft Windows 7 or later
- *Monitor* - Resolution of at least 1920 x 1080
- *Hard Drive Space* - 100 MB

2.2. Obtaining BaseOps

Visit the BaseOps web page, http://wasmerconsulting.com/baseops.htm, and download Noisemap, which will contain the latest version of BaseOps.

If desired, you can subscribe to the mailing list, and be notified by e-mail when new versions of BaseOps are released. See the BaseOps web page for additional information.

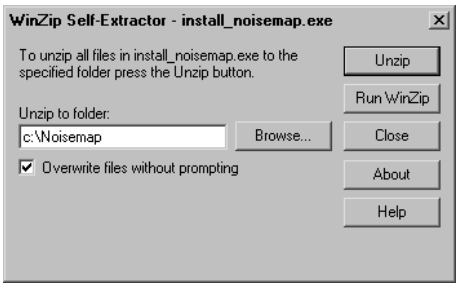
2.3. Installing Noisemap

BaseOps is distributed as part of Noisemap. The Noisemap installation routine will install the latest versions of BaseOps, NMap, AGM, MRNMap, Noisefile, Omega10, Omega11, and NMPlot.

Noisemap is distributed as a self-extracting WinZip file. Installation consists of nothing more than uncompressing the Noisemap files and copying them onto your hard drive. To install Noisemap, follow these steps.

1. Go the the BaseOps web site, http://wasmerconsulting.com/baseops.htm, and click on the Download Noisemap link. A file named `install_noisemap.exe` will be transferred to your computer.

2. From Windows Explorer or My Computer, find the file `install_noisemap.exe` and double-click on it. The Installing Noisemap dialog box appears.



3. In the *Unzip To Folder* text box, type the name of the directory where you wish to install Noisemap. Press the Browse button to display the Browse for Folder dialog box, which allows you to select an existing directory.

   The various components of Noisemap (BaseOps, NMap, NMPlot, etc.) will be installed in subdirectories of the Noisemap directory.

4. Press the Unzip button. The Noisemap files are copied to your hard disk. Noisemap is now installed.

5. The file `install_noisemap.exe` is no longer needed. Delete it if you wish.

2.4. Installing the Optional AAM Model

The Advanced Acoustic Model (AAM) is not included with the standard Noisemap installation package. If you wish to perform a noise analysis using AAM aircraft, you must first install AAM.

To install AAM, run the AAM installer, and choose to install AAM into the `Noisemap\AAM` directory. After a successful installation, the `Noisemap\AAM` directory will have new subdirectories, including `Noisemap\AAM\bin` (which will contain the AAM executable) and `Noisemap\AAM\ncfiles` (which will contain the AAM noise sphere files).

☞ ***Note:***

If you've been using previous versions of AAM with BaseOps, note the change in where the AAM files are located. Previously, everything was located in the `Noisemap\AAM` directory. Now, some files are located in subdirectories, as described above. You can delete

the old `aam.exe` and `netcdf.dll` files from the `Noisemap\AAM` directory, and move your `.nc` noise sphere files to the `Noisemap\AAM\ncfiles` subdirectory.

After installing AAM, read the file "`Noisemap\AAM\Default AAM Aircraft.txt`" for instructions on registering AAM aircraft with BaseOps.

As of January 2017, the point of contact for obtaining AAM was:

Juliet Page
Volpe National Transportation Systems Center
U.S. Department of Transportation
e-mail: juliet.page@dot.gov

2.5. Installing the Optional RNM Model

Important:

RNM is being replaced by the AAM. If you are starting a new project, it is recommended that you use AAM. RNM is still being supported primarily for existing legacy noise cases.

The Rotorcraft Noise Model (RNM) is not included with the standard Noisemap installation package. If you wish to perform a noise analysis using RNM aircraft, you must first install RNM. Simply follow the installation instructions included with the RNM distribution package, noting these points:

- To work with BaseOps, RNM must be installed in the `RNM` subdirectory of the `Noisemap` directory. All RNM files — including the `.exe` files, the `.dll` files, and the `.nc` files — should be present in the `Noisemap\RNM` directory.

  If you have already installed RNM in another location, move the RNM files to this directory and update your computer's `PATH` and `ROTOR_NOISE` environmental variables to reflect RNM's new location (see RNM documentation).

- The file "`Noisemap\RNM\RNM Aircraft.txt`" must contain a list of all RNM aircraft. If you add hemisphere (`*.nc`) files to RNM, you must edit this file. See the comments at the top of "`RNM Aircraft.txt`" for more details.

As of April 2019, RNM can be requested via the following website:

https://software.nasa.gov/software/LAR-17753-1

2.6. Upgrading to a Later Version of Noisemap

To upgrade to a later version of Noisemap, simply perform a normal installation, noting these points.

- If any Noisemap programs (BaseOps, NMap, NMPlot, etc.) are running, close them before performing the upgrade.
- Install Noisemap in the same directory that it was previously installed in.
- On the Installing Noisemap dialog box, make sure the *Overwrite Files Without Prompting* box is checked.
- The `Flight01.dat` and `Static01.dat` files in the `Noisemap\NMap` directory will be overwritten during the upgrade process. If you have modified these files, you should make copies of them before upgrading Noisemap.

All BaseOps configuration information is stored in the file `BaseOps.cfg`. This file will not be overwritten when you install later versions of Noisemap. Therefore, your configuration will be preserved.

2.7. Uninstalling Noisemap

The Noisemap installer does not make any hidden changes to your computer. In particular, it does not install any files in the Windows or System directories, and does not modify the registry. To uninstall Noisemap, simply use Windows Explorer or My Computer to delete the directory where Noisemap is installed.

2.8. Starting BaseOps

To start BaseOps, follow these steps.

1. Using Windows Explorer or My Computer, navigate to the folder where BaseOps is installed.
2. Double-click on the BaseOps icon,  , labeled `BaseOps.exe`.

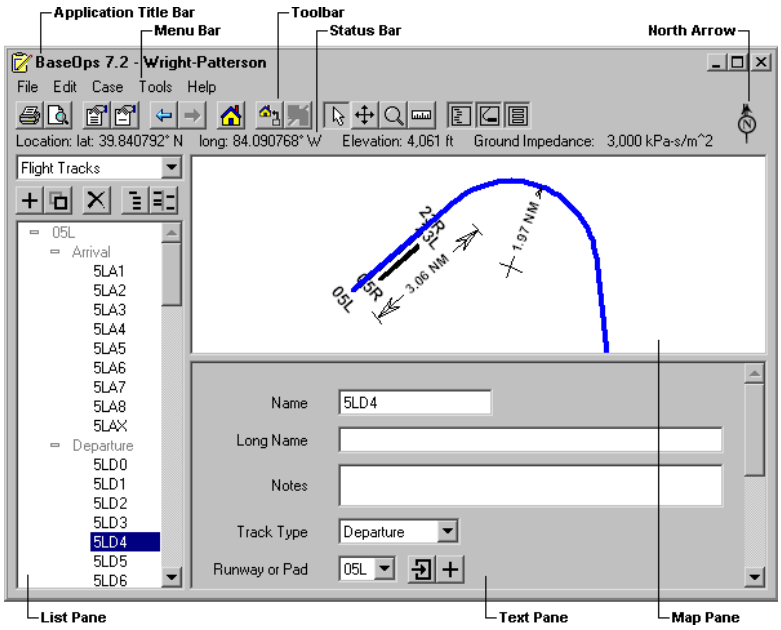
2.9. Getting Help

Press the F1 key at any time to access BaseOps's extensive online help system. Press Ctrl + F1 to display the BaseOps User's Guide table of contents. *Chapter 38, Accessing Help*, discusses the help system in detail.

Chapter 3

A Brief Tour of BaseOps

The following screen capture shows BaseOps' main window. The most important components are labeled.



3.1. Application Title Bar

BaseOps's application title bar displays the program icon, the program name and version, and buttons to minimize, maximize, and close the application.

Clicking on the program icon displays the Control menu, which contains commands for positioning, resizing, minimizing, maximizing, and closing BaseOps. Double-clicking on the

program icon closes BaseOps. Double-clicking on the title bar toggles the window between its maximized and normal sizes.

3.2. Menu Bar

The menu bar displays the headings for each of BaseOps's menus.

To display a menu, either click on its heading with the mouse, or press the Alt key plus the underlined letter in the heading of the menu. For example, to display the Help menu, press Alt + H. Note that on some versions of Microsoft Windows, the underline segments will be hidden until you press the Alt key.

To choose an item on a menu, either: click on the item; press the key corresponding to an underlined letter in the item's text; or select the item using the up and down arrow keys, and then press the Enter key.

The result of choosing a menu item depends on the item's type.

- Choosing a menu item that ends with a small triangle will cause a secondary menu to appear.
- Choosing a menu item that ends with three dots ... displays a dialog box. All dialog boxes have a Cancel button. Therefore, if you are browsing BaseOps's user interface, it is always safe to click on a menu item ending in three dots. You can inspect the dialog box and then cancel it.
- Choosing any other menu item will cause an action to immediately occur.

Menu items that do not currently apply will appear in gray.

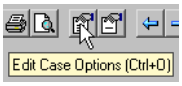
3.3. Toolbar

The toolbar displays buttons that provide quick access to frequently used commands in BaseOps. To activate a command, press its toolbar button. If a command is unavailable, its toolbar button will be gray.

The toolbar contains the following buttons:

Button	Description
	Print map or report
	Print preview map or report
	Edit case options
	Edit selected object's options
	Undo
	Redo
	Go back
	Go forward
	Go to map home view
	Set the home view of the selected object's map to the area currently displayed on the screen
	Automatically calculate the home view of the selected object's map
	Activate the select and edit mouse tool
	Activate the add mouse tool
	Activate the map panning tool
	Activate the map zooming tool
	Activate the map measurement tool
	Show or hide the list pane
	Show or hide the map pane
	Show or hide the text pane

If you forget the purpose of a toolbar button, briefly hold the mouse cursor over it. A tooltip window will appear, displaying a short description of the button.



3.4. Status Bar

The status bar, located below the toolbar, displays information that varies, depending on the action you are currently performing.

- If the mouse is over a map, the status bar displays the geographic coordinates, elevation, and ground impedance at the mouse's location. You can change the coordinate system used to display the geographic location (see *Section 4.8, Setting the Case Coordinate System*) and the units used to display the elevation (see *Section 4.9, Setting the Case's Physical Units*).

- If you are using the Measurement tool, the status bar displays the distance and heading between two points on a map. You can set the units used to display the measured distance: see *Section 4.9, Setting the Case's Physical Units*.

- If BaseOps is busy performing a lengthy operation, the status bar displays a message describing the operation. If possible, it also displays a progress bar showing the percentage of the operation completed.

3.5. North Arrow

The north arrow shows the direction of north on a map. True north and magnetic north are indicated by double- and single-prong arrows, respectively.

When BaseOps is busy performing a lengthy operation, the north arrow is replaced with an animated image of a stopwatch.

3.6. List Pane

The *list pane* displays all of the objects (runways, flight tracks, flight profiles, etc.) that comprise a BaseOps case. From the list pane, you can add, duplicate, and delete objects, set the sorting order in which objects are displayed, and select the object to display in the text and map panes. See *Chapter 5, Working with the List Pane*, for more information.

3.7. Text Pane

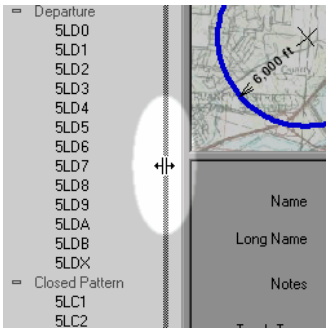
The *text pane* displays a text-based form that lets you edit the properties of the object currently selected in the list pane. For example, if a flight profile is currently selected, the text pane will contain a form that lets you set the profile's name, flight track, aircraft, etc.

3.8. Map Pane

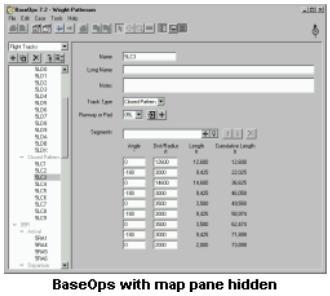
The *map pane* displays a graphical representation of the object currently selected in the list pane. For example, if a flight track is currently selected, the text pane displays a map showing the straight and curved segments that make up the track. See *Chapter 6, Working with the Map Pane*, for more information.

3.9. Working with Panes

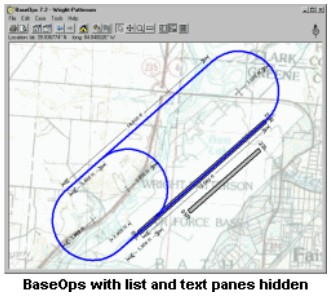
The relative sizes of the list, text, and map panes can be changed. Using the mouse, grab and drag the separators between the panes.



You can temporarily hide any combination of the three panes. This increases the size of the other panes, giving you more room to work.



BaseOps with map pane hidden



BaseOps with list and text panes hidden

To hide or unhide the list pane, you can:

- Press the Show Or Hide List Pane button on the toolbar
- Press Ctrl + L

To hide or unhide the text pane, you can:

- Press the Show Or Hide Text Pane button on the toolbar
- Press Ctrl + T

To hide or unhide the map pane, you can:

- Press the Show Or Hide Map Pane button on the toolbar
- Press Ctrl + M

Chapter 4

Introduction to Cases

A BaseOps *case* is a collection of all information associated with a Noisemap noise analysis. A case includes...

- all data used as input to the noise models: runways, flight tracks, weather information, etc.
- presentation information: customized reports, physical units, coordinate systems
- map style information: colors, fonts, background map layers, etc.

Cases are stored in files that have the extension `.baseops`. BaseOps is a tool for editing these case files. As you work with its various user interface components (the list pane, the case options dialog box, etc.), you edit the case that is currently open. This is analogous to using Microsoft Word to edit a `.doc` document file.

This chapter discusses the basics of creating and editing cases. Later chapters discuss the various elements of a case in detail.

4.1. Creating a New Case

To create a new case, follow these steps.

1. Choose New from the File menu. The standard Windows dialog box for selecting a file name is displayed. Familiarity with the use of this dialog box is assumed.
2. Navigate to the directory where you want your case file to be created. Type the name of the file that will contain the new case. Then press Save.
3. A new, empty case appears in the BaseOps window.

4.2. Opening an Existing Case

To open an existing case, follow these steps.

1. Choose Open from the File menu. The standard Windows dialog box for opening files is displayed. Familiarity with the use of this dialog box is assumed.

2. Navigate to the directory where your case file is located, then open the file. Case files typically have the extension `.baseops`.

3. The case appears in the BaseOps window.

 ***Note:***

BaseOps can also open other types of files: `.bps` (old-style BaseOps files); `.ops` and `.opx` (NMap/AAM/RNM input files); `.inp` (old-style MRNMap input files); and `.ins` and `.inx` (MRNMap input files). If one of these types of files is opened, a `.baseops` case file containing the imported data will automatically be created.

4.3. Saving a Case

BaseOps has no explicit save command. Cases are automatically saved at key moments (when BaseOps is shut down, when a new case is opened, etc.). In addition, BaseOps periodically saves your case as you work, so that even if your computer should crash, you will lose, at most, a couple of minutes of work.

4.4. Renaming a Case

To rename a case file, following these steps.

1. Choose Save As from the File menu. The standard Windows dialog box for selecting a file name is displayed. Familiarity with the use of this dialog box is assumed.

2. Navigate to the directory where you want your renamed case file to be located. Type the new name of the case file. Then press Save.

Alternatively, you can use Windows Explorer or My Computer to move and/or rename the `.baseops` case file.

4.5. Editing Case Data

Case data consists of all information used as input into the noise models: runways, flight tracks, weather information, etc. Case data is viewed and edited using the three panes (the list, text, and map panes) of the BaseOps main window. For more information, see *Chapter 3, A Brief Tour of BaseOps*; *Chapter 5, Working with the List Pane*; and *Chapter 6, Working with the Map Pane*.

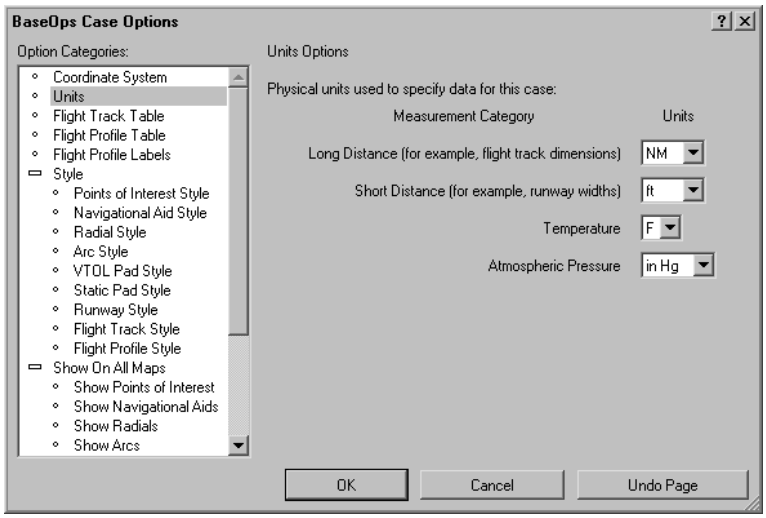
4.6. Editing Case Options

Case options control how BaseOps presents information to you. Examples of case options include the units used for entering distances and the color of flight tracks when they are drawn on a map.

Use the Case Options dialog box to view and edit case options. To display the Case Options dialog box, you can:

- Choose Edit Case Options from the Case menu
- Press the Edit Case Options button on the toolbar
- Press Ctrl + O

The left portion of the dialog box displays a list of option categories. One category in this list is always selected. The right portion of the dialog box displays controls that allow you to change the options in the selected category.



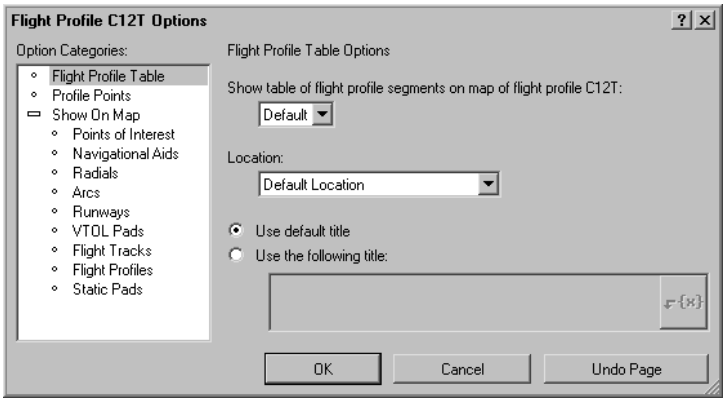
The Case Options dialog box is a Multiple Page dialog box. See *Section B.2, Multiple Page Dialog Boxes*, for more information.

4.7. Editing an Object's Options

Many of the objects (runways, flight tracks, flight profiles, etc.) that make up a BaseOps case have options that you can edit. To edit the selected object's options, you can:

- Choose Edit *ObjectName* Options from the Case menu, where *ObjectName* is the name of the selected object
- Press the Edit Object Options button on the toolbar
- Press Ctrl + N

The Object Options dialog box is displayed.



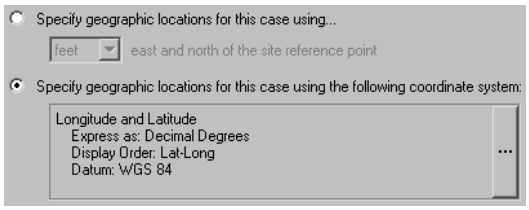
The left portion of the dialog box displays a list of option categories. One category in this list is always selected. The right portion of the dialog box displays controls that allow you to change the options in the selected category.

The Object Options dialog box is a Multiple Page dialog box. See *Section B.2, Multiple Page Dialog Boxes*, for more information.

4.8. Setting the Case Coordinate System

The *case coordinate system* is used by BaseOps to specify geographic locations. This is the coordinate system used to enter the location of objects such as runways and navigational aids, and to display locations in reports and on the status bar.

Use the Coordinate System page of the Case Options dialog box to set the case coordinate system.



Select the coordinate system. You have two options.

- *Specify geographic locations for this case using...east and north of the site reference point* - Locations are specified in either feet or meters east and north of the site reference point. See *Section 10.4, Reference Point*, for information on the site reference point.

- *Specify geographic locations for this case using the following coordinate system* - Select the coordinate system. See *Section 37.1, Coordinate System Control*, for more information.

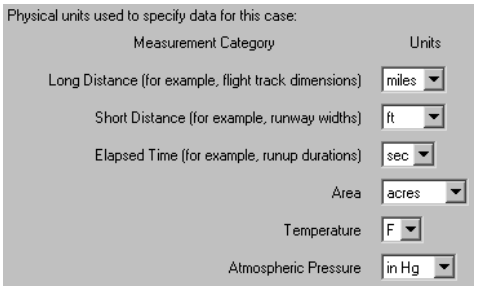
Tip:

You can change the case coordinate system at any time. Any previously entered locations will be displayed in the new coordinate system.

4.9. Setting the Case's Physical Units

The *case's physical units* are used by BaseOps to specify distances, temperatures, etc. These are the units used to enter object properties such as runway widths, and to display values in reports and on the status bar.

Use the Units page of the Case Options dialog box to set the case units.



For each measurement category, select the desired units. The following categories are available.

- **Long Distance** - Used to specify distances and lengths that can potentially have a magnitude of several miles, such as flight track segment lengths and radii, flight profile tracks distances, DME arc radii, and distances measured using the map measurement tool.

- **Short Distance** - Used to specify shorter distances that would typically be expressed using feet or meters, such as heights and altitudes, runway widths, takeoff and landing displacements, and grid point spacings.

  Sound absorption coefficients are specified in units of dB/1000 *Short Distance Units*.

- **Elapsed Time** - Used to specify the duration of time periods, such as flight profile runup times.

- **Area** - Used to specify the area of regions, such as military operations areas.

- **Temperature**
  Atmospheric Pressure - Used to specify the case weather conditions. See *Chapter 11, Setting Weather Conditions*.

Tip:

You can change a case's physical units at any time. Any previously entered values will be displayed in the new units.

4.10. Using Undo and Redo

BaseOps has an undo feature that allows you to reverse any changes you have made to a BaseOps case. This feature is similar to the undo feature found in most word processors — each time you choose undo, the BaseOps case is restored to the state it was in before the most recent edit.

To undo an edit, you can:

- Choose Undo from the Edit menu
- Press the Undo toolbar button 
- Press Ctrl + Z

To redo a previously undone edit, you can:

- Choose Redo from the Edit menu

- Press the Redo toolbar button 
- Press Ctrl + Shift + Z

 ***Note:***

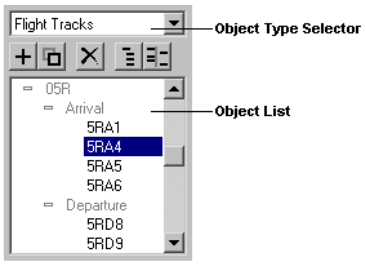
You can disable the undo system if the amount of memory it uses becomes problematic. You should need to do this only in rare circumstances, such as when you are using a computer with very limited memory.

To disable the undo system, choose Application Options from the Tools menu, go to the Undo System page of the BaseOps Application Options dialog box, then uncheck the *Undo system enabled* box.

Chapter 5

Working with the List Pane

The list pane, located along the left side of the BaseOps main window, displays the objects (runways, flight tracks, flight profiles, etc.) in a BaseOps case.



The list pane. The selected object type is "Flight Tracks", and the selected object is flight track "5RA4".

The list pane is composed of two main parts: the *object type selector* and the *object list*. Use the object type selector to choose the object type (runways, flight tracks, etc.) of interest. This is known as the *selected object type*. All objects of the selected type will be displayed in the object list.

Note:

The available object types will vary, depending of which noise models you have selected. For example, airspace profiles are only used by the MRNMap noise model. If MRNMap is not selected, then airspace profiles will not appear in the object type selector. See *Section 10.3, Noise Models*, for more information.

One object in the object list is always selected. This is known as the *selected object*. The selected object is the one that you are currently working with. Before you can edit or delete an object, you must first select it.

Above the object list is a row of buttons that allow you to add, duplicate, and delete objects, and set sorting and filtering options for the object list.

 ***Note:***

A BaseOps case can contain only a single instance of some types of objects (for example, the Weather object). If the object list displays an object of this type, the various buttons (Add, Delete, etc.) will be grayed out.

 ***Tip:***

If you prefer working with the keyboard, use to following shortcuts to move the keyboard focus to the list pane.

- Press Alt + T to move the focus to the object type selector
- Press Alt + L to move the focus to the object list

5.1. Adding a New Object

To add a new object of the selected object type, you can:

- Press the Add button +
- Press Ctrl + A

5.2. Duplicating Objects

To create new objects that are copies of existing objects, first select the existing objects, then either:

- Press the Duplicate button
- Press Ctrl + D

See *Section 5.9, Selecting Multiple Objects*, for instructions on how to select multiple objects.

5.3. Deleting Objects

To delete objects from a BaseOps case, first select the objects, then either:

- Press the Delete button
- Press Ctrl + Del

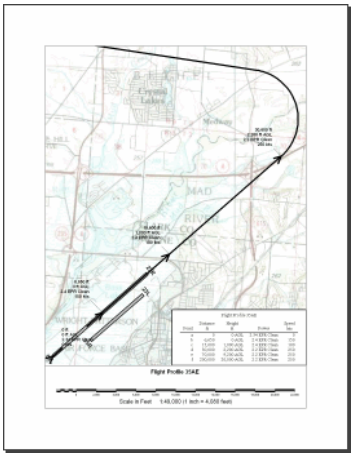
See *Section 5.9, Selecting Multiple Objects*, for instructions on how to select multiple objects.

5.4. Printing Objects

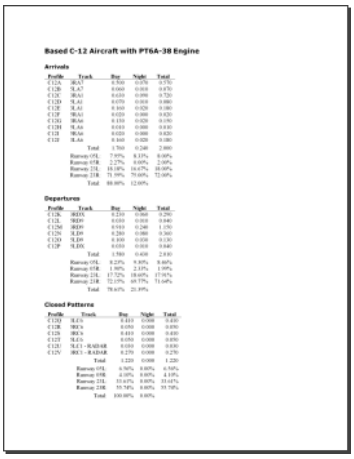
To print objects, first select them, then either:

- Press the Print button on the application toolbar
- Press Ctrl + P
- Choose Print from the File menu

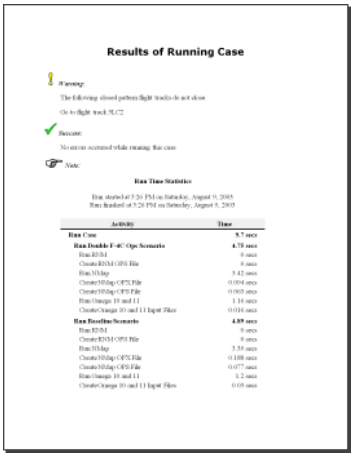
If a mappable object (i.e., an object that can be displayed on a map, such as a flight track or a flight profile) is selected, then a map of that object is printed.



If a report is selected, then it is printed.



If the messages object is selected, then the messages are printed.



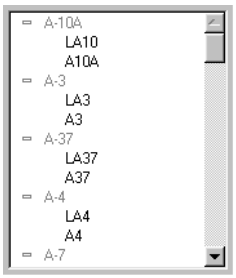
5.5. Copying, Cutting and Pasting Objects

You can use the clipboard to transfer objects between BaseOps cases. Use the Cut, Copy, and Paste commands on the Edit menu. The object list must have the keyboard focus in order to cut or copy objects.

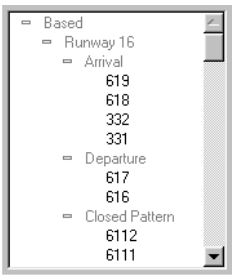
See *Section 5.9, Selecting Multiple Objects*, for instructions on how to select multiple objects.

5.6. Sorting and Grouping the Object List

You can sort and group the objects in the object list. Objects will be displayed in outline form, based upon the sorting/grouping criteria you specify.



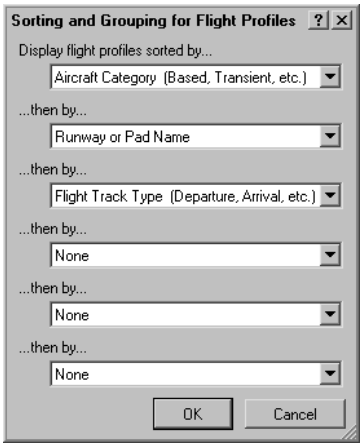
Object list, with flight profiles sorted by aircraft name



Object list, with flight profiles sorted by aircraft category, then by runway name, then by flight track type

To sort and group the object list, follow these steps.

1. Either press the Sort button, or else press Ctrl + S. The Sorting and Grouping dialog box is displayed.



2. Use the drop-down lists to select the criteria for sorting. Objects will be sorted and grouped by the criteria you select, starting with the top criterion and working down the list. The available criteria will depend on the selected object type.

   Once you have selected all of the desired criteria, set the remaining drop-down lists to "None".

5.7. Filtering the Object List

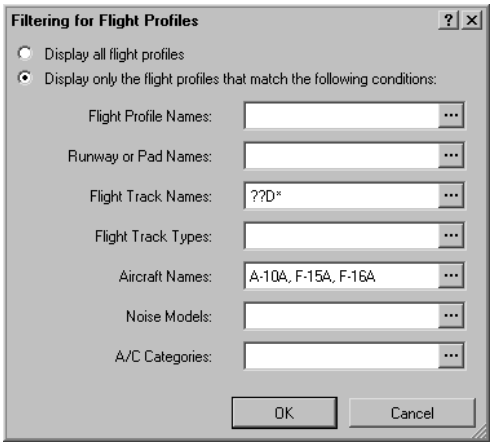
You can filter the objects that are displayed in the object list. Only those that match your criteria are displayed. For example, you can choose to display only the flight profiles for a particular aircraft.

Note:

If filtering is in effect, the Filter button will be colored bright yellow and red. This serves as a reminder that there may be hidden objects that are not currently displayed in the object list.

To filter the object list, follow these steps.

1. Either press the Filter button, or else press Ctrl + F. The Filtering dialog box is displayed.



2. Choose the criteria for displaying the objects. The available criteria will depend on the selected object type.

   Enter the valid values for each criteria in the text boxes provided, separating the values with commas. For example, in the above screen capture, the Aircraft Names text box contains "A-10A, F-15A, F-16A", so only the flight profiles with those three aircraft will be displayed.

   Only those objects that meet **all** of the criteria you specify will be displayed. If you do not wish to select objects based upon a particular criteria, then delete any text in the box associated with that criteria.

   If desired, you can use *wildcards* to specify your criteria. These are special characters that can be used to match a range of names. BaseOps recognizes the following wildcards.

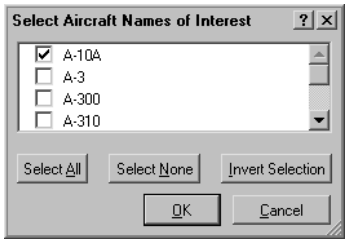
   - ***** - Matches any sequence of zero or more characters. For example, `A*B` would match `AB`, `AXB`, or `AXXB`.

   - **?** - Matches exactly one of any character. For example, `A?B` would match `AXB`, but not `AB` or `AXXB`.

- **[ABC]** - Match any one of the characters A, B, or C. For example, A[XY]B would match AXB or AYB, but not AB, AXXB, or AZB.

- , - Matches either what is on the left or right side of the comma. For example, AA,BB would match AA or BB.

As an alternative to typing, you can specify your criteria by selecting from a list of available values. Press one of the Choose From List buttons ···. The Select dialog box is displayed.



Check the boxes next to the value(s) of interest. For example, in the above screen capture, the A-10A aircraft is selected, but the A-3 aircraft is not.

5.8. Using the Back and Forward Buttons

As you edit a case in BaseOps, you use the list pane to select a sequence of objects. The back button allows you to easily return to recent selected objects. This works similarly to the back button in a web browser, which allows you to return to the recently viewed web pages.

To go back in the sequence of selected objects, you can:

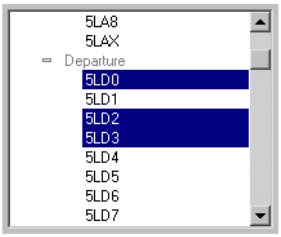
- Press the Back toolbar button
- Press Ctrl + B

To go forward in the sequence of selected objects, you can:

- Press the Forward toolbar button
- Press Shift + Ctrl + B

5.9. Selecting Multiple Objects

You can select multiple objects in the object list, and then duplicate, delete, cut, copy, print, or print preview them in a single operation. You can also run various tools, such as the Flight Track Assignment Tool, on the selected set of objects.



The object list with more than one object selected.

To select more than one object, you can:

- Press Shift + ↑, Shift + ↓, Shift + PgUp, Shift + PgDn, Shift + Home, or Shift + End to extend the current selection.
- Press the Enter key to toggle an object between the selected and deselected states.
- Press a navigation key (Arrow Key, PgUp, PgDn, Home, or End) while holding down the Ctrl key to move the keyboard focus without deselecting previously selected objects.
- Click on an object while holding down the Shift key to extend the current selection.
- Click on an object while holding down the Ctrl key to toggle the object between the selected and deselected states.
- Choose Select All from the Edit menu to select all objects.

Chapter 6

Working with the Map Pane

The map pane, located in the upper-right corner of the BaseOps main window, displays a graphical representation of the object currently selected in the list pane. The map is not simply a static image. You can interact with it, zooming and panning to display regions of interest, determining the coordinates of locations, measuring the distance between points, and editing object properties.

6.1. Displaying Coordinates on the Status Bar

To determine the geographic coordinates of a location on a map, point to that location with the mouse. The coordinates are displayed on the status bar, and are automatically updated as the mouse is moved.

You can change the coordinate system used to display the location: see *Section 4.8, Setting the Case Coordinate System*.

6.2. Mouse Tools

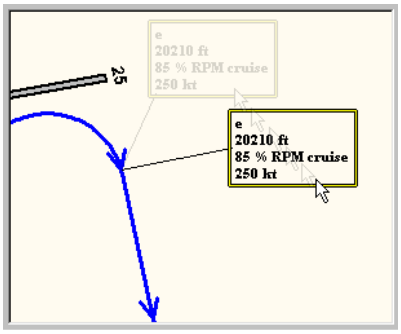
BaseOps provides a number of tools for working with maps. For example, the Measurement tool allows you to measure the distance between two points on a map.

To use a tool, you must first *activate* it by pressing its button on the toolbar. When the mouse cursor is over a map, the cursor changes shape to indicate which tool is active.

The tools are described in detail in this chapter.

6.3. The Select and Edit Mouse Tool

Use the Select and Edit tool to edit properties of the selected object.



Example of using the Select and Edit tool: moving a flight profile point label

Activate the tool by pressing its button on the toolbar. The actions you can perform with the tool depend on the selected object type.

If a flight track is selected, you can:

- drag the end of a curved segment to change the curve angle.
- drag the middle of a curved segment to change the curve radius.
- drag the end of a straight segment to change its length. In addition, if the straight segment is preceded by a curved segment, the curve angle can also be changed.
- drag the segments table to another corner of the map.
- double-click on either a segment or the segments table to edit its properties.
- delete either a segment or the segments table by selecting it on the map and then pressing Ctrl + Delete.

If a flight profile is selected, you can:

- drag a profile point to another location on the flight track.
- drag a point label to another position on the map.
- drag the segments table to another corner of the map.
- double-click on a profile point, a point label, or the segments table to edit its properties.

- delete a profile point, a point label, or the segments table by selecting it on the map and then pressing Ctrl + Delete.

If a runway is selected, you can:

- drag the ends of the runway to new locations.
- drag the runway center to move the entire runway without changing its length or heading.

If a military operations area is selected, you can drag the area's vertex points to new locations on the map.

If a military training route is selected, you can:

- drag a segment point to another location on the map.
- drag a point label to another position on the map.
- double-click on a segment point or a point label to edit its properties.
- delete a segment point or a point label by selecting it on the map and then pressing Ctrl + Delete.

If a manually-entered elevation or ground impedance data source is selected, you can:

- drag a data point to a new location.
- double-click on a data point to edit its properties.
- delete a data point by selecting it on the map and then pressing Ctrl + Delete.

For most other types of object (navigational aids, points of interest, etc.), you can drag the object to another location on the map. To move an avoidance area, grab the center of the area.

Caution:

When BaseOps draws a map, it attempts to position all tables and labels so that they appear pleasing to the eye. The method that it uses is not perfect, so BaseOps gives you the ability to manually position these items. However, it is recommended that you use restraint, as manually positioning an item prevents BaseOps from adapting the map in response to future changes, such as adding additional profile points or printing the map on paper of a new size or orientation.

6.4. The Add Mouse Tool

Use the Add mouse tool to specify locations on the map that should be added to a BaseOps case.

Activate the tool by pressing its button on the toolbar. The actions you can perform with the tool depend on the selected object type.

Some types of objects (for example, static pads) are defined by a single location. To add a new instance of one of these point-type objects, select the type of object using the object type selector dropdown list, activate the Add mouse tool, then click on the map. See *Chapter 13, Editing Point Objects*, for a list of the point object types. You can also add avoidance areas; click on the location of the avoidance area's center.

Some types of objects are defined by a list of locations. For example, a military operations area is a polygonal area defined by vertex points. Use the Add mouse tool to add new points to such objects. You can add points to the following types of objects:

- Flight Profiles (click on the flight track to add a new profile point)
- Military Operations Areas (click on the map to add a new vertex point)
- Military Training Routes (click on the map to add a new segment point)
- Manually-entered Elevation and Ground Impedance data sources

Tip:

You may sometimes find yourself switching back and forth between using the Select and Edit and the Add mouse tools. As a convenience in such situations, hold down the Ctrl key to make the Add mouse tool temporarily act like the Select and Edit mouse tool, and vice versa.

6.5. Zooming and Panning

Zooming refers to increasing or decreasing the magnification level at which a map is displayed. *Panning* refers to moving a map horizontally or vertically, so that previously hidden portions of the map become visible.

6.5.1. The Zoom Mouse Tool

Activate the Zoom mouse tool by pressing its button on the toolbar. When the Zoom tool is active, you can:

- zoom in by clicking on a map with the left mouse button.
- zoom out by clicking on a map with the right mouse button.

When the Zoom tool is active, you can drag a rectangular area using the left mouse button. The plot is zoomed and panned so that this area fills the plot window.

6.5.2. The Pan Mouse Tool

Activate the Pan mouse tool by pressing its button on the toolbar. When the Pan tool is active, you can drag with the left mouse button to pan the map.

6.5.3. Using the Mouse Wheel

If your mouse has a wheel button, you can use it to zoom and pan the map.

Roll the wheel forward to zoom in. Roll the wheel backward to zoom out. Hold down the Ctrl key while rolling the wheel to zoom in finer increments.

Pan by pressing and holding the wheel button. A small marker appears at the point where you press the button. While holding the button down, move the mouse cursor away from the marker. The map pans in the direction that you move the mouse. The farther the mouse is from the marker, the faster the map pans. Release the mouse button to stop panning.

Alternatively, click and release the wheel button. BaseOps enters panning mode. Move the mouse to pan the map. Exit panning mode by clicking the wheel button a second time.

Tip:

You can zoom and pan using the mouse wheel regardless of which mouse tool is active. This provides you with a convenient way to zoom and pan while using the other mouse tools.

6.5.4. Keyboard Shortcuts

The following keyboard shortcuts allow you to pan and zoom a map regardless of which mouse tool is active. If the map does not respond to keyboard commands, give it the keyboard focus by clicking on it with the mouse, pressing Alt + M, or repeatedly pressing Tab.

Key	Action
↑	Pan up
Ctrl + ↑	Pan up faster
↓	Pan down
Ctrl + ↓	Pan down faster
←	Pan left
Ctrl + ←	Pan left faster
→	Pan right
Ctrl + →	Pan right faster
+	Zoom in
-	Zoom out

6.6. The Home View

When an object's map is first displayed, the area of the map that is initially visible is known as the *home view*. By default, the home view is set so that the map shows the "interesting" features of the object.

The home view is important when printing a map: the map will be zoomed and panned so that the home view fills the printable area of the paper.

If, after scrolling and zooming, you wish to return to the home view, press the Home View button on the toolbar.

You can manually set the home view of an object's map, overriding the default. To do so, press the Set Home View button on the toolbar. The selected object's home view will be set to the portion of the map currently visible on the screen.

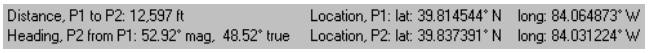
If you have manually set an object's home view, and wish to revert to having the home view automatically calculated, press the Automatically Calculate Home View button on the toolbar.

Tip:

If you are setting a map's home view prior to printing the map, you should adjust the shape of the map pane so that it is approximately the same shape as the paper upon which you will print the map. See *Section 3.9, Working with Panes*, for information on changing the shape of the map pane.

6.7. The Measurement Mouse Tool

Use the Measurement tool to measure the distance and heading between two points on a map. Activate the tool by pressing its button on the toolbar. To measure the distance between two points, press and hold the left mouse button over the first point, then move the mouse to the second point. The status bar displays the coordinates of the two points, the distance between them, and the directional heading (both true and magnetic) from the first point to the second.



You can change the coordinate system used to display the location of the two points: see *Section 4.8, Setting the Case Coordinate System*.

You can change the units used to display the distance between the two points: see *Section 4.9, Setting the Case's Physical Units*.

The heading is the direction of the second point as seen from the first point, measured in degrees east of (either true or magnetic) north.

Chapter 7

Customizing Maps

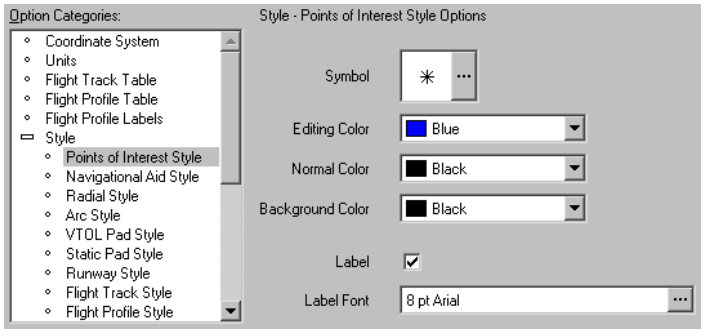
BaseOps gives you considerable control over the appearance of the maps associated with a case. You can...

- control the style (colors, fonts) used to draw and label the various map components.
- add components to some or all maps (for example, displays runways on all maps, or display a DME arc on the map of a particular flight track).
- display tables of flight track and flight profile segments on maps of flight tracks and flight profiles, respectively.
- control the text and placement of flight profile and military training route point labels.

7.1. Setting the Style of Map Components

To customize the style (colors, fonts, etc.) used to draw and label the various components of the maps in a BaseOps case, follow these steps.

1. Display the Case Options dialog box.
2. Go to the Style pages of the Case Options dialog box.



3. There is one dialog box page for each type of object (runways, flight tracks) that can be displayed on a map. Visit each style page and set the properties as desired, noting these points:

    - The *Editing Color* is the color used to draw an object that is being edited: i.e., the selected object.

    - The *Normal Color* is the color used to draw objects that are the principal subject of a map, but that are not currently being edited. This occurs when you are printing a map.

    - The *Background Color* is the color used to draw objects that are displayed as annotating features of a map (for example, a DME arc displayed on the map of a flight track: see *Section 7.2, Annotating Maps with BaseOps Objects*) .

    - The *Fill Color* is the color used to fill the interior of an area.

    - The *Opacity* of a fill color controls how transparent the color is. Values range from 0% (totally transparent) to 100% (totally opaque). Intermediate values tint the area while allowing the background to show through.

    - See *Section B.10, Color Control*, for information on selecting colors.

    - The *Symbol* is used to indicate the locations of point objects: navigational aids, static pads, etc. Press the Select Symbol button  to display the Select Symbol dialog box, which allows you to browse the available symbols. See *Section B.12, Symbol Control*.

    - The *Line Width* or *Outline Width* is the thickness, in millimeters, of lines used to draw objects. Typically, widths are between 0.1 to 2.0 millimeters.

    - The *Line Pattern* specifies the style of a line: solid, dotted, dashed, etc. See *Section B.11, Line Pattern Control*, for more information.

    - Check the *Label* box to label objects on the map. Labels are drawn in the *Label Font*: see *Section B.9, Font Control*, for information on selecting fonts. *Label Text Color* is the color of the label text.

    - Flight track segments are labeled with their dimensions. *Label Line Color* is the color of the lines used to label the dimensions.

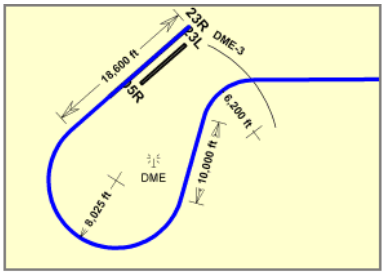
    - Some objects (for example, flight profiles) are labeled with text boxes that display information about parts of the object. *Callout Line Color* and *Callout Line Width* are the color and thickness, respectively, of the lines that connect the text boxes to parts of the objects that the labels refer to.

- Check the *Show Arrows* box to draw arrowheads at each flight profile point indicating the direction that aircraft are traveling at that point. *Arrow Size* and *Arrow Line Width* are the length and thickness, respectively, of the lines used to draw the arrowheads.

- Check the *Show Headings* box if you would like static pad symbols to be rotated so that they indicate the magnetic heading(s) of the aircraft that use them.

7.2. Annotating Maps with BaseOps Objects

BaseOps can display maps of objects such as flight tracks and flight profiles. These maps can display other objects as annotating features. For example, a map of a flight track can include a DME arc that is relevant to defining that track.



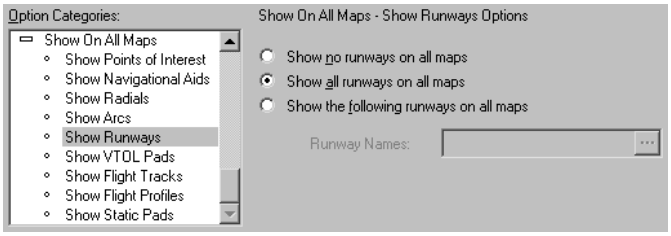
A map of a flight track, with runways, a navigational aid, and a DME arc added to the map as annotating features.

7.2.1. Adding Annotating Objects to All Maps

To select the objects that will appear as annotating features on all of the maps in a BaseOps case, follow these steps.

1. Display the Case Options dialog box.

2. Go to the Show on All Maps pages of the Case Options dialog box.



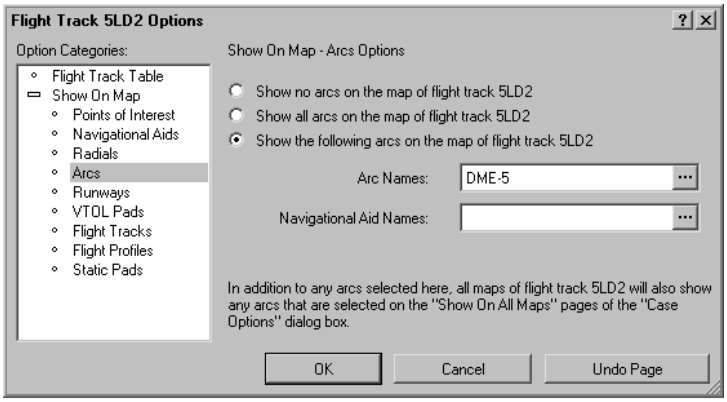
3. There is one dialog box page for each type of object (runways, flight tracks) that can be displayed on a map. Visit each page and select the objects that should be displayed on all maps.

Selecting the objects to display to the maps is similar to selecting the objects to display in the object list. See *Section 5.7, Filtering the Object List*, for more information.

7.2.2. Adding Annotating Objects to a Specific Map

To add annotating objects to a specific map, follow these steps.

1. Select the object whose map is being annotated.
2. Display the Object Options dialog box for the selected object.
3. Go to the Show on Map pages of the Object Options dialog box.



Adding a DME arc to the map of flight track 5LD2

4. There is one dialog box page for each type of object (runways, flight tracks) that can be displayed on a map. Visit each page and select the objects that should be displayed on the map of the selected object.

   Selecting the objects to display on the map is similar to selecting the objects to display in the object list. See *Section 5.7, Filtering the Object List*, for more information.

7.3. Displaying Flight Track and Flight Profile Tables

Every flight track has a table associated with it. The *flight track table* displays the straight and curved line segments that make up a flight track

Flight Track 5RA6

Go straight 300,000 ft
Turn right 180° with radius 2,500 ft
Go straight 4,500 ft
Turn right 180° with radius 2,500 ft
Go straight 4,500 ft

Sample Flight Track Table

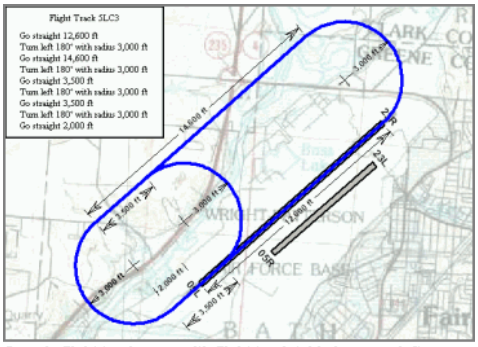
Flight profiles also have an associated table. The *flight profile table* displays the profile aircraft's altitude, airspeed, and power setting as a function of distance along the profile's flight track.

Flight Profile C21L

Point	Distance ft	Height ft	Power	Speed kts
a	0	0 AGL	95 % NC Takeoff	0
b	2,500	0 AGL	95 % NC Takeoff	111
c	14,600	1,000 AGL	95 % NC Cruise	200
d	200,000	9,200 AGL	95 % NC Cruise	250

Sample Flight Profile Table

You can display flight track and flight profile tables on maps of flight tracks and flight profiles, respectively.



Sample flight track map, with flight track table in upper-left corner

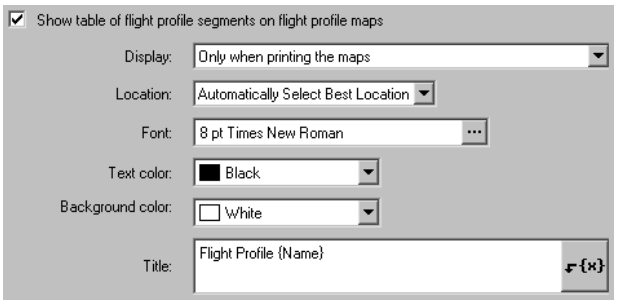
Note:

The processes for adding flight profile and flight track tables to maps are very similar. Therefore, only flight profile tables will be discussed in detail. Keep in mind, however, that the following instructions also apply to flight track tables.

7.3.1. Customizing Table Options

To display flight profile tables on flight profile maps, follow these steps.

1. Display the Flight Profile Table page of the Case Options dialog box.



2. Check the box labeled *Show table of flight profile segments on flight profile maps*.

3. *Display* - Select when the table should be shown. You can choose to display it only when a map is printed. Alternatively, you can always display the table, even on the screen.

4. *Location* - Select the location on the map where the flight profile table should appear. You have five choices.

    - *Automatically Select Best Location* - BaseOps will automatically select a location for the table that minimizes conflict with the important parts of the flight profile map.

    - *Lower Left Corner*
      Lower Right Corner
      Upper Left Corner
      Upper Right Corner - The table will be placed in the selected corner of the flight profile map.

5. *Font* - Select the font of the flight profile table text. See *Section B.9, Font Control*, for information on selecting fonts.

6. *Text color* - Select the color of the flight profile table text. See *Section B.10, Color Control*, for information on selecting colors.

7. *Background color* - Select the background color of the flight profile table. See *Section B.10, Color Control*, for information on selecting colors.

8. *Title* - Type the title that will appear at the top of the flight profile table. The title can have as many lines as desired. Press the Enter key to insert a new line.

    The title can include *symbolic fields*, placeholders for text that is automatically inserted when the title is displayed. For example, the field {Name} is automatically replaced with the name of the flight profile.

    Press the Insert Symbolic Field button, located to the right of the text box, to display a list of fields from which you can choose. See *Section B.5, Symbolic Fields Text Control*, for more information about symbolic fields.

7.3.2. Customizing Table Options for Specific Flight Profiles

You can override the following table options on a profile-by-profile basis.

- Whether or not the table is displayed
- The table's location on the flight profile map
- The table's title

This is useful on crowded flight profile maps, where the table may obscure important features. You can manually select the table's location, or remove it entirely from selected flight profile maps.

To override flight profile table options for the selected profile, go to the Flight Profile Table page of the Flight Profile Options dialog box. See *Section 4.7, Editing an Object's Options*, for more information.

Using the Select and Edit mouse tool, you can edit a table's options by double-clicking on it. You can also drag the table to another corner of the map. See *Section 6.3, The Select and Edit Mouse Tool*.

Caution:

When BaseOps draws a flight profile map, it attempts to position the profile points table so that it does not cover important parts of the map. The method BaseOps uses is not perfect, so you are given the ability to manually position the table. However, it is recommended that you use restraint, as manually positioning the table prevents BaseOps from adapting the map in response to future changes, such as adding additional profile points or printing the map on paper of a new size or orientation.

7.4. Displaying Flight Profile Labels

Profile points are key parts of a flight profile. They are locations along a flight track where the profile aircraft's power setting, height, and airspeed are specified.

BaseOps can display profile points on a flight profile map. Each point includes a label that shows details about that point.

7.4.1. Customizing Labels

To customize flight profile point labels, follow these steps.

1. Display the Flight Profile Labels page of the Case Options dialog box.

2. Edit the labels as desired.

   Note that there are separate labels for flight profiles with different categories of aircraft. This is because the profile point information varies. For example, the thrust vector angle is relevant only for AAM vectored-thrust aircraft.

   The labels can include *symbolic fields*, placeholders for text that is automatically inserted when the label is displayed. For example, the field {Height} is automatically replaced with the aircraft's height at the profile point to which the label refers.

   Press the Insert Symbolic Field button {x}, located to the right of the text box, to display a list of fields from which you can choose. See *Section B.5, Symbolic Fields Text Control*, for more information about symbolic fields.

7.4.2. Customizing Labels for Specific Flight Profile Points

You can override the following options for any flight profile point label.

- Whether or not the label is displayed
- The label's text

- The label's location on the flight profile map

This is useful on crowded flight profile maps. You can rearrange the label locations, and if necessary, reduce the amount of label text, or even eliminate the label completely, for some profile points.

To override flight profile label options for the selected flight profile, go to the Profile Points page of the Flight Profile Options dialog box. See *Section 4.7, Editing an Object's Options*, for more information.

Using the Select and Edit mouse tool, you can edit a label's options by double-clicking on it. You can also drag the label to another location on the map. See *Section 6.3, The Select and Edit Mouse Tool*.

Caution:

When BaseOps draws a flight profile map, it attempts to position all profile point labels so that they appear pleasing to the eye. The method that it uses is not perfect, so BaseOps gives you the ability to manually position labels. However, it is recommended that you use restraint, as manually positioning a label prevents BaseOps from adapting the map in response to future changes, such as adding additional profile points or printing the map on paper of a new size or orientation.

7.5. Displaying Military Training Route Labels

Segment points are key parts of a military training route. They define the vertices of the route centerline, and also the route's width and floor.

BaseOps can display segment points on a military training route map. Each point includes a label that shows details about that point.

The tasks of customizing military training route labels is very similar to the task of customizing flight profile labels. See *Section 7.4, Displaying Flight Profile Labels*, for more information.

Chapter 8

Changing the Map Background

BaseOps gives you considerable control over the background of a case's maps. It can be as simple as a solid color, or as complicated as a set of map layers displaying themes such as roads and rivers.

8.1. Background Color

When BaseOps draws a map, it first fills the entire map with the background color. To set the background color, follow these steps.

1. Go to the Background Color page of the Case Options dialog box.

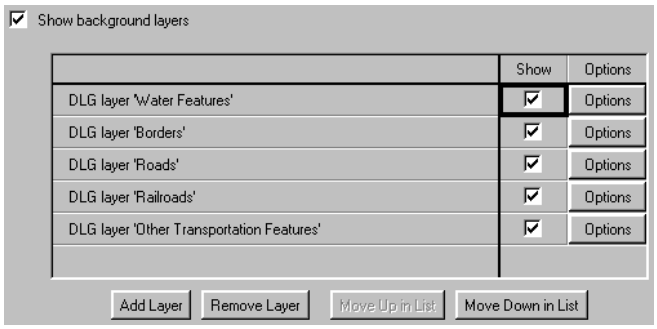
2. *Background color:* Select the background color. See *Section B.10, Color Control*, for information on selecting colors.

8.2. Background Layers

BaseOps can display a case's maps with one or more background layers. The layers can be stored in a number of common Geographic Information System (GIS) formats. These formats are discussed in detail in *Chapter 9, Background Map Formats*.

8.2.1. Managing Background Layers

Use the Background Layers page of the Case Options dialog box to manage background layers.



Check the *Show background layers* box to display background layers. If this box is not checked, no layers will be shown.

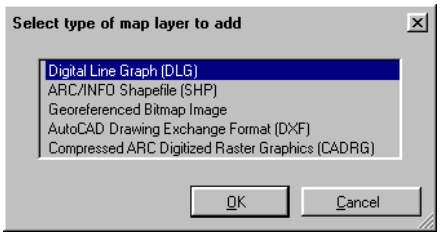
The *background layers list* displays all background layers. This list is presented using a spreadsheet control. See *Section B.7, Spreadsheet Control*, for more information.

8.2.2. Adding a Background Layer

To add a background layer, follow these steps.

1. If desired, select an existing layer by clicking on it. The new layer will be added just before the selected layer. Ignore this step if the list is empty.

2. Press the Add Layer button, located below the background layers list. The Select Layer Type dialog box is displayed.



3. Choose the type of layer you would like to add, then press OK. As a shortcut, simply double-click on the desired layer type.

   The background map layer types are described in *Chapter 9, Background Map Formats*.

4. A new layer, of the appropriate type, is added to the list.

5. Press the new layer's Options button. The layer's options dialog box appears. Set the layer options as desired.

8.2.3. Removing a Background Layer

To remove a background layer, follow these steps.

1. Select the layer to remove by clicking on it in the background layers list.
2. Press the Remove Layer button, located below the background layers list.

8.2.4. Ordering Background Layers

Background layers are drawn in order, starting with the last layer in the background layers list. This means that the topmost layer in the list is drawn last, and therefore appears on top of other layers. Generally, you will want to order the list so that the most important layers are at the top.

 *Note:*

Background layers are drawn in three stages. All area features are drawn first, followed by all line features, and finally all point features. This means that a filled area feature will not obscure a point feature, regardless of the ordering of the layers. This matches most people's intuitive idea of how layers should work.

To change the ordering of layers in the list, follow these steps.

1. Select a layer by clicking on it in the background layers list.
2. Press the Move Up In List or Move Down In List button to move the selected layer. These buttons are located just below the background layers list.

   If you press and hold one of these button, it will automatically repeat. This is useful for moving a layer several rows up or down.

8.2.5. Hiding or Displaying a Background Layer

Use the Show column of the background layers list to selectively hide or display individual layers. A layer will be displayed only if its Show box is checked.

8.2.6. Changing a Background Layer's Options

Use the Options column of the background layers list to change the options used to display a layer. Pressing a layer's Options button will display that layer's options dialog box.

Chapter 9

Background Map Formats

BaseOps can display background map layers stored in the following Geographic Information System (GIS) formats.

- ARC/INFO Shapefile (SHP)
- Digital Line Graph (DLG)
- AutoCAD Data Exchange Format (DXF)
- Georeferenced Bitmap (BMP, TIF, JPG, PNG)
- Slippy Map
- Compressed ARC Digitized Raster Graphics (CADRG)

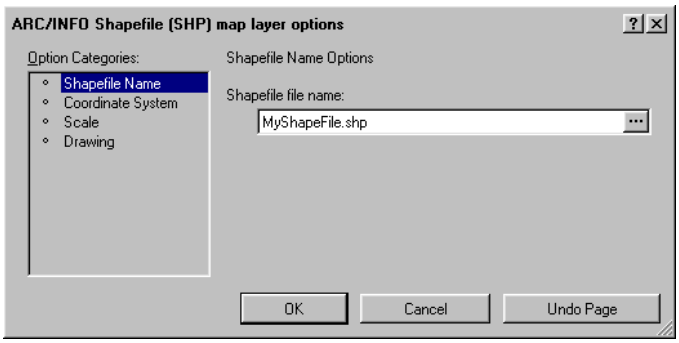
This chapter discusses each of these formats in detail.

See *Section 8.2, Background Layers*, for instructions on adding background map layers to a map.

9.1. ARC/INFO Shapefile (SHP)

9.1.1. Shapefile Map Layer Options Dialog Box

Use the Shapefile Map Layer Options dialog box to configure a shapefile map background layer.



The Shapefile Map Layer Options dialog box is a Multiple Page dialog box. See *Section B.2, Multiple Page Dialog Boxes*, for more information.

9.1.2. Shapefile Name Options Page

Use the Shapefile Name page of the Shapefile Map Layer Options dialog box to set the name of the shapefile you wish to display.

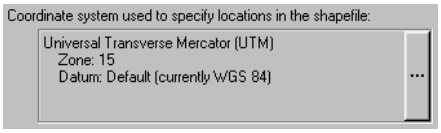
Type the name of the file containing the shapefile. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

Note:

A single shapefile actually consists of three files: a main file, an index file, and an attribute file. These files should have the extensions `.shp`, `.shx`, and `.dbf`, respectively. On the Shapefile Name page, specify the name of the main file (i.e., the `.shp` file).

9.1.3. Coordinate System Options Page

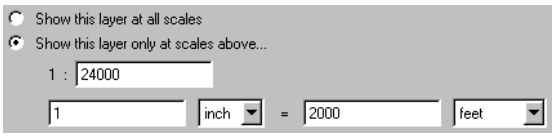
Use the Coordinate System page of the Shapefile Map Layer Options dialog box to specify the coordinate system used by the shapefile.



See *Section 37.1, Coordinate System Control*, for instructions on specifying a coordinate system.

9.1.4. Scale Options Page

Use the Scale page of the Shapefile Map Layer Options dialog box to specify the scales at which this shapefile is displayed.

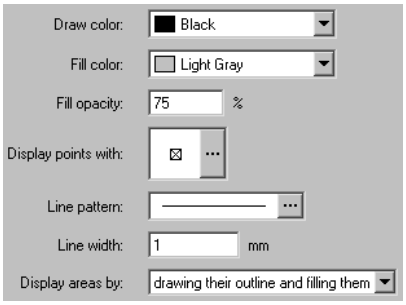


If a map is displayed at a scale below the one you specify, the shapefile layer is not displayed. This is useful if you have shapefiles with varying levels of detail. Using multiple shapefiles, you can construct maps that reveal more detail as you zoom in.

For example, assume that you have two shapefiles. The first contains main roads, and the second contains secondary roads. You can set the main roads layer to display at all scales, and the secondary roads layer to display only at scales above 1:24,000. This prevents the secondary roads from cluttering the map if you view it at a smaller scale.

9.1.5. Drawing Options Page

Use the Drawing page of the Shapefile Map Layer Options dialog box to specify the style (colors, line widths, etc.) used to draw features in the shapefile.



You can set the following options.

- *Draw color:* Select the color used to draw point features, line features, and the outlines of area features. See *Section B.10, Color Control*, for information on selecting colors.

- *Fill color:* Select the color used to fill the interior of area features. For example, if the shapefile contains areas representing lakes, you can set the fill color to blue.

- *Fill opacity:* Select the opacity of the fill color. The opacity may range from 0% (totally transparent) to 100% (totally opaque). An intermediate opacity will tint areas with a translucent color that allows the background to show through.

- *Display points with:* Select the symbol used to display point features. Press the Select Symbol button ... to display the Select Symbol dialog box, which allows you to browse the available symbols. See *Section B.12, Symbol Control*.

- *Line pattern:* Select the dash pattern (dashed, dotted, solid, etc.) of lines used to draw line features and the outlines of area features. See *Section B.11, Line Pattern Control*, for information on selecting line patterns.

- *Line width:* Type the width, in millimeters, of lines used to draw line features and the outlines of area features. Typical widths are between 0.2 to 1.0 millimeters.

- *Display areas by:* Select how area features are displayed. You have three options.

    - Draw their outlines

    - Fill their interiors with a solid color

    - Both draw their outlines and fill their interiors

9.1.6. Technical Details

BaseOps can display shapefile records of the following types.

- Point

- PointZ

- PointM

- Multipoint

- MultipointZ

- MultipointM

- PolyLine

- PolyLineZ

- PolyLineM

- Polygon

- PolygonZ

- PolygonM

Shapefiles containing a mixture of record types are supported.

Only the Main (.shp) file is required. The Index (.shx) and Attribute (.dbf) files may be present, but are not used. Attributes are not loaded.

The shapefile format is controlled by Environmental Systems Research Institute, Inc (ESRI), the makers of the ARC/INFO GIS system. The official specifications are documented in an ESRI white paper titled "ESRI Shapefile Technical Description", which can be found on the ESRI web site, http://www.esri.com . As of September 2000, the URL for this document was http://www.esri.com/library/whitepapers/pdfs/shapefile.pdf.

9.2. Digital Line Graph (DLG)

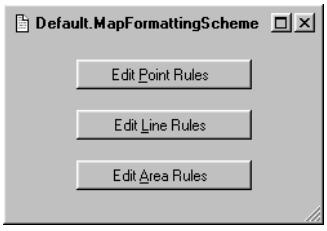
9.2.1. Map Formatting Schemes

Every map feature in a Digital Line Graph (DLG) file contains *attribute codes* that specify properties of the feature. For example, a line feature might have the attribute codes for Primary Road and Under Construction. An attribute code consists of two integers: a 3-digit *major code*, and a 3- or 4-digit *minor code*. Attribute codes are standardized and documented: see *Section 9.2.3, Technical Details*.

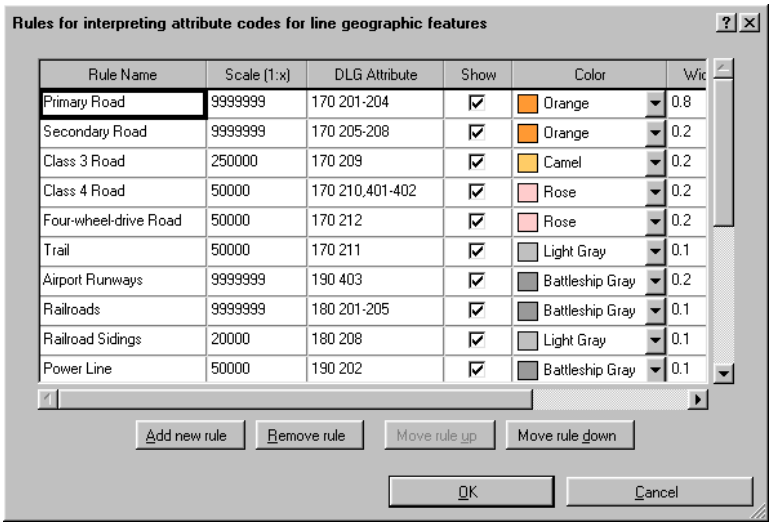
A *map formatting scheme* is a file containing rules that associate attribute codes with display styles. For example, a rule might state that line features with the code 170 212 (four-wheel-drive roads) should be drawn in a thin gray dashed line.

Map formatting schemes are stored in files with the extension `.mapformattingscheme`. You can create, view, and edit map formatting schemes using the NMPlot application, which is included with Noisemap.

To open an existing scheme, choose Open from the NMPlot File menu, then select a map formatting scheme file. A map formatting scheme document window appears.



Map formatting scheme rules are divided into three groups, according to whether they apply to point, line, or area map features. Press one of the buttons to edit a group's rules. For example, if you press the Edit Line Rules button, a dialog box appears that allows you to edit the rules used for line features.



The rules in a map formatting scheme are very similar to the display rules used for geographic annotations in the NMPlot application. If you wish to edit map formatting schemes, obtain the NMPlot User's Guide (see *Appendix F, Contacting Wasmer Consulting*) and review the chapter titled *Displaying Geographic Annotations*. Map Formatting Scheme rules are edited in the same fashion as NMPlot geographic annotation display rules, with three exceptions.

1. Map Formatting Scheme rule tables have an additional column labeled Rule Name. This column is used to give a descriptive name to a rule.

2. Instead of columns labeled Category and Name, map formatting scheme rule tables have a column labeled DLG Attribute Codes. Map Formatting Scheme rules are matched against a DLG feature's attribute codes in the same way that Grid Geographic Annotation display rules are matched against an annotation's category and name. In the DLG Attribute Codes column, type the attribute codes associated with each rule. Here are some examples.

    - "170 201" matches DLG features with the attribute code 170 201.
    - "170 201..205" matches DLG features with a major code of 170, and a minor code between 201 and 205.
    - "170 201,203" matches DLG features with a major code of 170, and a minor code of either 201 or 203.

- "170 201 and 170 603" matches DLG features with both attribute codes 170 201 and 170 603.
- "170 201 then 170 603" matches DLG feature with both attribute codes 170 201 and 170 603, with 170 603 following 170 201 in the feature's list of codes.
- " " matches DLG features with no attribute codes.

As an example, "170 201-208 and 170 603,604" matches all primary and secondary roads under construction.

3. Map Formatting Scheme rule tables have an additional column labeled Scale (1:x). This column allows you to specify the minimum scale at which matching DLG features are displayed. If a map is displayed at a scale below a rule's scale, any DLG features matching that rule are not displayed. This allows you to construct maps that reveal more detail as you zoom in.

 ***Note:***

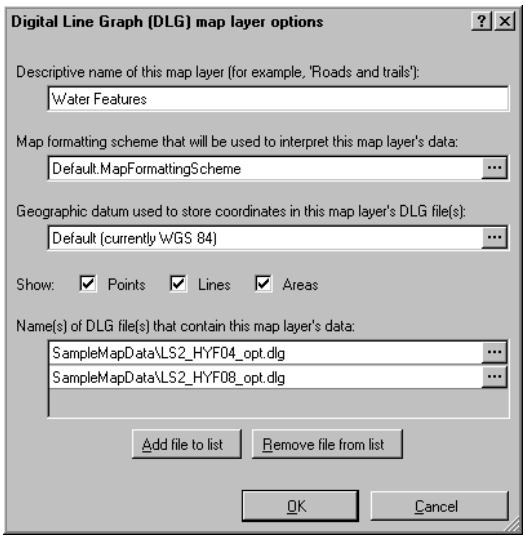
BaseOps is distributed with a default map formatting scheme. This scheme is in the file `Default.MapFormattingScheme`, which can be found in the directory where BaseOps is installed.

 ***Note:***

This section provides only the briefest introduction to attribute codes. If you intend to modify map formatting schemes, obtain the official DLG documentation, which describes attribute codes in detail. See *Section 9.2.3, Technical Details*, for information on obtaining the documentation.

9.2.2. Digital Line Graph (DLG) Options Dialog Box

Use the Digital Line Graph Map Layer Options dialog box to configure a DLG map background layer.



Descriptive name of this map layer: Type a short description of this map layer. Examples are "Roads" and "Water Features". This allows you to identify this layer in the future.

Map formatting scheme that will be used to interpret this map layer's data: Type the name of the file containing the map formatting scheme used to display this DLG layer. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file. Map formatting schemes typically have the extension `.mapformattingscheme`. See *Section 9.2.1, Map Formatting Schemes*.

Geographic datum used to store coordinates in this map layer's DLG file(s): Select the DLG files' geographic datum. See *Section B.14, Datum Control*, for information on selecting datums. See *Appendix E, Introduction to Datums*, for general information on datums.

Important:

Many DLG files supplied by the United States Geological Survey (USGS) are in the North American Datum of 1927 (NAD-27). Make sure that you know the correct datum for your DLG files.

Show Points, Lines, Areas: Check the boxes corresponding to the geographic features you wish to display. Typically, all three boxes should be checked. However, if necessary, you can restrict which features are displayed. For example, you can choose to display only point geographic features.

Name(s) of DLG file(s) that contain this map layer's data: Type the names of the DLG files that you wish to display as part of this layer. Any number of files can be listed. Press one of the Browse buttons ..., which are located to the right of the file name text boxes, to display the Open

File dialog box, which allows you to browse for a file. DLG files typically have the extension `.dlg`.

Press the Add File To List button to add a file. Remove a file by clicking on it with the mouse, and then pressing the Remove File From List button.

9.2.3. Technical Details

BaseOps can read 1:24000 and 1:100000, level 3, optional format DLG files.

The coordinate system of the DLG file must be Universal Transverse Mercator (UTM).

The DLG file cannot contain DLG accuracy records.

BaseOps can display DLG records of the following types.

- N (Node)
- L (Line)
- A (Area)

DLG files containing a mixture of record types are supported.

BaseOps can merge DLG topology data in layers containing more than one DLG file.

The DLG format is controlled by the National Mapping Division of the United States Geological Survey (USGS). The official specifications are documented in a technical report titled "Standards for Digital Line Graphs", which can be found on the USGS web site, http://www.usgs.gov. As of September 2000, the URL for this document was http://rockyweb.cr.usgs.gov/nmpstds/dlgstds.html. This document contains a list of all DLG attribute codes.

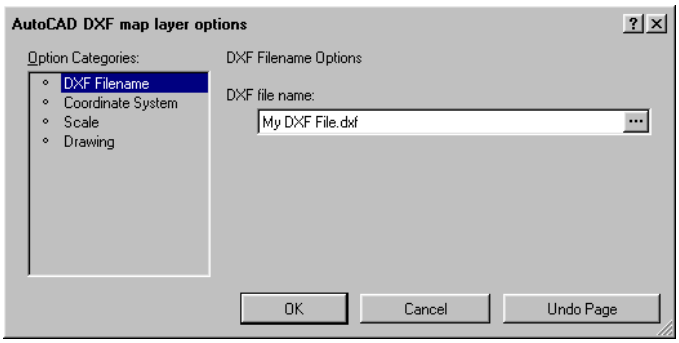
9.3. AutoCAD Data Exchange Format (DXF)

Warning:

Use the DXF format as a last resort, only if no alternative is available. DXF is a very ambiguous format, which results in different applications interpreting the same DXF file in different ways. You can expect fewer problems using other formats, such as ARC/INFO Shapefile or Digital Line Graph.

9.3.1. DXF Map Layer Options Dialog Box

Use the DXF Map Layer Options dialog box to configure a DXF map background layer.



The DXF Map Layer Options dialog box is a Multiple Page dialog box. See *Section B.2, Multiple Page Dialog Boxes*, for more information.

9.3.2. DXF Filename Options Page

Use the DXF Filename page of the DXF Map Layer Options dialog box to set the name of the DXF file you wish to display.

Type the name of the DXF file. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file. This file will typically have the extension `.dxf`.

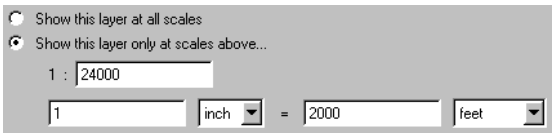
9.3.3. Coordinate System Options Page

Use the Coordinate System page of the DXF Map Layer Options dialog box to specify the coordinate system used by the DXF file.

See *Section 37.1, Coordinate System Control*, for instructions on specifying a coordinate system.

9.3.4. Scale Options Page

Use the Scale page of the DXF Map Layer Options dialog box to specify the scales at which this DXF file is displayed.

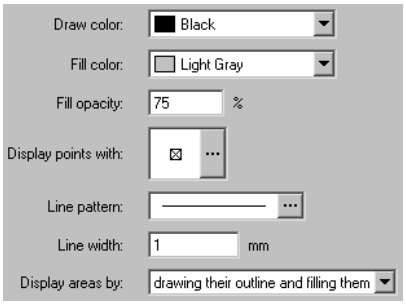


If a map is displayed at a scale below the one you specify, the DXF layer is not displayed. This is useful if you have DXF files with varying levels of detail. Using multiple DXF files, you can construct maps that reveal more detail as you zoom in.

For example, assume that you have two DXF files. The first contains main roads, and the second contains secondary roads. You can set the main roads layer to display at all scales, and the secondary roads layer to display only at scales above 1:24,000. This prevents the secondary roads from cluttering the map if you view it at a smaller scale.

9.3.5. Drawing Options Page

Use the Drawing page of the DXF Map Layer Options dialog box to specify the style (colors, line widths, etc.) used to draw features in the DXF file.



You can set the following options.

- *Draw color:* Select the color used to draw point features, line features, and the outlines of area features. See *Section B.10, Color Control*, for information on selecting colors.

- *Fill color:* Select the color used to fill the interior of area features. For example, if the DXF file contains areas representing lakes, you can set the fill color to blue.

- *Fill opacity:* Select the opacity of the fill color. The opacity may range from 0% (totally transparent) to 100% (totally opaque). An intermediate opacity will tint areas with a translucent color that allows the background to show through.

- *Display points with:* Select the symbol used to display point features. Press the Select Symbol button ... to display the Select Symbol dialog box, which allows you to browse the available symbols. See *Section B.12, Symbol Control*.

- *Line pattern:* Select the dash pattern (dashed, dotted, solid, etc.) of lines used to draw line features and the outlines of area features. See *Section B.11, Line Pattern Control*, for information on selecting line patterns.

- *Line width:* Type the width, in millimeters, of lines used to draw line features and the outlines of area features. Typical widths are between 0.2 to 1.0 millimeters.

- *Display areas by:* Select how area features are displayed. You have three options.

    - Draw their outlines

    - Fill their interiors with a solid color

    - Both draw their outlines and fill their interiors

9.3.6. Technical Details

BaseOps can display DXF entities of the following types.

- POINT

- LINE

- POLYLINE

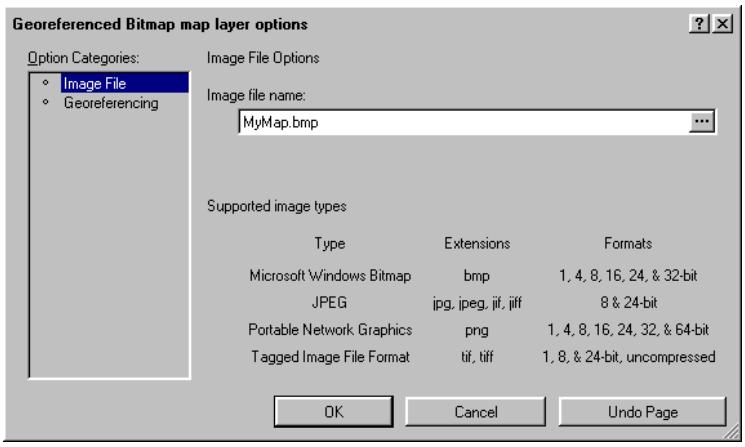
BaseOps recognizes entities in either BLOCKS or ENTITIES sections.

The DXF format is controlled by Autodesk, Inc., the makers of AutoCAD. The official specifications are documented in an appendix of the AutoCAD Reference Manual.

9.4. Georeferenced Bitmap

9.4.1. Georeferenced Bitmap Map Layer Options Dialog Box

Use the Georeferenced Bitmap Map Layer Options dialog box to configure a Georeferenced Bitmap Image map background layer.



The Georeferenced Bitmap Map Layer Options dialog box is a Multiple Page dialog box. See *Section B.2, Multiple Page Dialog Boxes*, for more information.

9.4.2. Image File Options Page

Use the Image File page of the Georeferenced Bitmap Map Layer Options dialog box to set the name of the bitmap image file you wish to display.

Type the name of the bitmap image file. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

BaseOps can read the following types of bitmap image files.

- Microsoft Windows Bitmap (bmp)
- GIF (gif)
- JPEG (jpg, jpeg)
- Portable Network Graphics (png)
- Tagged Image File Format (tif, tiff), uncompressed

9.4.3. Georeferencing Options Page

Use the Georeferencing page of the Georeferenced Bitmap Map Layer Options dialog box to specify the portion of the Earth's surface represented by the bitmap image.

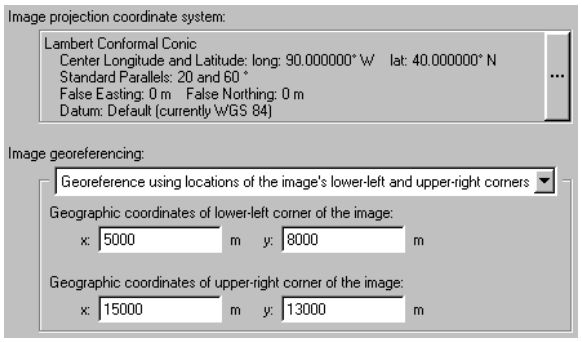


Image projection coordinate system: Select the projection coordinate system of the bitmap image. See *Section 37.1, Coordinate System Control*, for information on specifying a coordinate system.

Image georeferencing: Use the drop-down list to select the method for georeferencing the image. You have three choices.

- *Georeference using locations of the image's lower-left and upper-right corners* - Specify the geographic coordinates of the image's lower-left (i.e., southwest) and upper-right (i.e., northeast) corners. The coordinates must be supplied in the image's projection coordinate system.

- *Georeference using location of the image's lower-left corner, and size of the image* - Specify the geographic coordinates of the image's lower-left (i.e., southwest) corner. The coordinates must be supplied in the image's projection coordinate system. Also specify the width (i.e., the east-west extent) and the height (i.e., the north-south extent) of the image. The units used to specify the width and height depend upon the projection coordinate system.

- *Georeference using location of the image's lower-left corner, and size of an image pixel* - Specify the geographic coordinates of the image's lower-left (i.e., southwest) corner. The coordinates must be supplied in the image's projection coordinate system. Also specify the width (i.e., the east-west extent) and the height (i.e., the north-south extent) of a single pixel in the image. The units used to specify the width and height depend upon the projection coordinate system.

- *Georeference using location of the image's upper-left corner, and size of the image* - Specify the geographic coordinates of the image's upper-left (i.e., northwest) corner. The coordinates must be supplied in the image's projection coordinate system. Also specify the width (i.e., the east-west extent) and the height (i.e., the north-south extent) of the image. The units used to specify the width and height depend upon the projection coordinate system.

- *Georeference using location of the image's upper-left corner, and size of an image pixel* - Specify the geographic coordinates of the image's upper-left (i.e., northwest) corner. The coordinates must be supplied in the image's projection coordinate system. Also specify the width (i.e., the east-west extent) and the height (i.e., the north-south extent) of a single pixel in the image. The units used to specify the width and height depend upon the projection coordinate system.

- *Georeference using world file* - BaseOps will read georeferencing information from a world file associated with the image. The world file must have the same file name as the image, and must have one of the following extensions:

  .wld, .wf, .worldfile, .twf, .tifw, .tiffw, .tfw, .bwf, .bmpw, .bpw, .pwf, .pngw, .pnw, .pgw, .jwf, .jpgw, .jpegw, .jpw, .jgw

  For example, if the image file is named "Chicago.bmp", an acceptable world file name would be "Chicago.wld".

   ***Note:***

  A world file is a standard way of specifying georeferencing information for a bitmap image. The format was defined by Environmental Systems Research Institute, Inc (ESRI).

  A world file is a simple text file consisting of 6 numbers, each on a separate line.

  The first number is the size of an image pixel in the X (east-west) direction.

  The second and third numbers are rotation terms. BaseOps does not currently support world file rotation. Therefore, these numbers must be zero.

  The fourth number is the size of an image pixel in the Y (north-south) direction. This number is usually negative: see below.

  The fifth number is the X coordinate of the center of the upper-left image pixel.

  If the fourth number is **negative**, the sixth number is the Y coordinate of the center of the **upper**-left image pixel.

  If the fourth number is **positive**, the sixth number is the Y coordinate of the center of the **lower**-left image pixel.

Note:

You should be able to find georeferencing information in the documentation that accompanies your bitmap image. If you do not have this information, ask the person or organization who supplied the image. Or, contact your local GIS expert. If BaseOps does not support your image's projection, contact the developers: see *Appendix F, Contacting Wasmer Consulting*.

Georeferenced bitmap images are often distributed with an accompanying world file, which contains georeferencing information. However, keep in mind that a world file does not contain information about an image's projection. Your image's projection must be entered into BaseOps by hand.

Caution:

You can display any number of georeferenced images on a single map. However, all of the images must have compatible projection coordinate systems. BaseOps will allow you to create a map with images in different projections, but this should be attempted only if you have a thorough understanding of map projections. To be safe, novices should insure that all georeferenced images have exactly the same projection.

9.4.4. Technical Details

BaseOps can read bitmap images in the following formats.

- BMP: 1-, 4-, 8-, 16-, 24-, and 32-bits
- GIF: 1- and 8-bits
- JPEG: 8- and 24-bits
- PNG: 1-, 4-, 8-, 16-, 24-, 32-, and 64-bits
- TIFF: 1-, 8- and 24-bits, uncompressed

9.5. Compressed ARC Digitized Raster Graphics (CADRG)

9.5.1. Compressed ARC Digitized Raster Graphics (CADRG) Map Layer Options Dialog Box

Use the Compressed ARC Digitized Raster Graphics (CADRG) Map Layer Options dialog box to configure a CADRG map background layer.

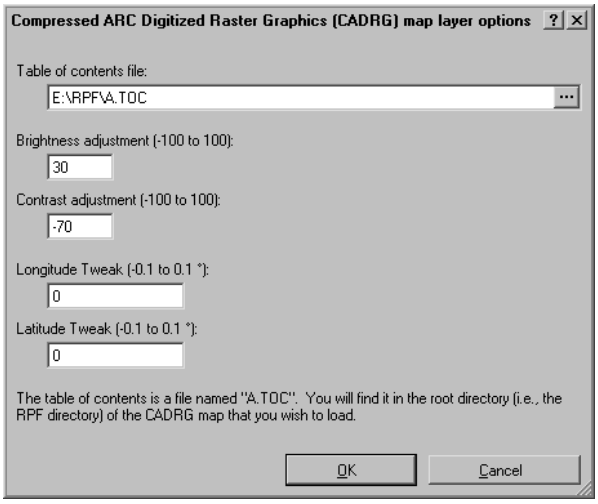


Table of contents file: Type the name of the CADRG table of contents file. Press the Browse button ···, located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

The CADRG table of contents is a file is named `A.TOC`. You will find it in the root directory (i.e., a directory named `RPF`) of the CADRG map you wish to load.

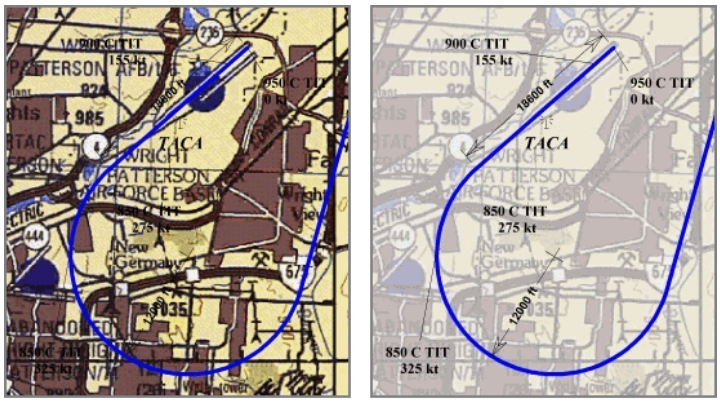
Brightness adjustment:
Contrast adjustment: Type numbers between -100 and 100 to indicate how much the brightness and contrast of the CADRG map should be adjusted before it is displayed. Values of 0 leave the map unchanged. Values above 0 increase the brightness and contrast; value below 0 decrease the brightness and contrast.

Longitude Tweak:
Latitude Tweak: Type numbers between -0.1 and 0.1 to indicate how much the CADRG map should be shifted in degrees longitude and latitude. If foreground elements do not line up exactly with the background CADRG map, use non-zero values to shift the map slightly. The appropriate tweak values are best found using trial and error.

Tip:

As distributed, most CADRG maps are poor backgrounds. The map colors are too intense, making it difficult to see any foreground detail displayed over the map.

In most situations, you should adjust the brightness and contrast so that the map colors are muted. As a starting point, try a brightness adjustment of 30 and a contrast adjustment of -70. These values have been found to work well with most CADRG maps distributed by the United States' National Imagery and Mapping Agency.



Brightness = 0, Contrast = 0 | Brightness = 30, Contrast = -70

Tip:

CADRG maps are typically distributed on a CD-ROM. If desired, you can copy the CADRG map to your hard drive. Simply copy the RPF directory, taking care to preserve the subdirectory structure.

A CADRG map will load much faster from a hard drive. It may also be more convenient to use, since you do not have to insert a CD-ROM.

Warning:

CADRG maps can be huge. Uncompressed, they can be several thousand megabytes in size. BaseOps supports incremental loading: it reads sections of the CADRG map on an as-needed basis. However, as you zoom out on a map, you cause more CADRG map data to be loaded. If you zoom out far enough, enough map data can be loaded to overwhelm even the largest computer.

 *Note:*

Do not confuse the Compressed ARC Digitized Raster Graphics (CADRG) format with the Digital Raster Graphics (DRG) format developed by the United States Geological Survey. They are different formats.

9.5.2. Technical Details

Compressed ARC Digitized Raster Graphics (CADRG) is a georeferenced bitmap format for storing background maps. It was developed by the United States Department of Defense's Defense Mapping Agency (now known as NIMA, the National Imagery and Mapping Agency).

The CADRG format is documented in military specification MIL-PRF-89038 (formerly MIL-C-89038), dated 6 October 1994, and Amendment 1, dated 27 April 1999. These documents can be downloaded from the NIMA web site, http://www.nima.mil/. As of September 2001, the URLs for PDF versions of these documents were http://www.nima.mil/publications/specs/printed/89038/89038_CADRG.pdf and http://www.nima.mil/publications/specs/printed/89038/89038_A1.pdf.

9.6. SlippyMap

SlippyMap is a standard for accessing map data via the internet. Maps are transmitted as bitmap image tiles that are downloaded on an as-needed basis.

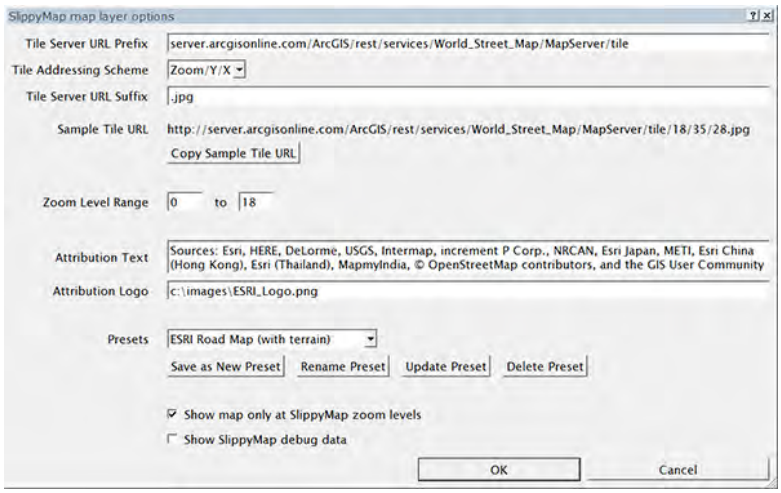
Numerous SlippyMap servers on the internet are available that supply maps in a variety of styles. Some servers are supported by donations and supply their maps for free with no restrictions. Others require acknowledgment and/or a paid subscription.

 *Important:*

SlippyMap providers can and do enforce restrictions on how their map data is used. Using SlippyMap data in a manner that does not meet the provider's restrictions is a violation of law, and can results in legal liabilities. You are responsible for determining a providers restrictions and abiding by them.

9.6.1. SlippyMap Map Layer Options Dialog Box

Use the SlippyMap Map Layer Options dialog box to configure a SlippyMap background layer.



Tile Server URL Prefix:
Tile Addressing Scheme:
Tile Server URL Suffix: Each SlippyMap tile image is accessed by a URL (i.e., an internet address) that encodes the server location and parameters, along with the tile's zoom level and geographic location. Each SlippyMap server will document their URL format. *Tile Addressing Scheme* is the format used to describe the tile's zoom level and geographic location. *Tile Server URL Prefix* and *Tile Server URL Suffix* are the text of the URL before and after the addressing scheme. Note that the text "http:\\" and "\" will automatically be added before/after the URL prefix.

Tip:

If BaseOps is downloading and displaying SlippyMap data, but the resultant maps appears scrambled, it is likely that the incorrect tile addressing scheme has been selected. If you have tried all available schemes and the map still appears scrambled, it is possible that the SlippyMap server is using an addressing scheme that is not currently supported. In this case, contact BaseOps's developers: see *Appendix F, Contacting Wasmer Consulting*.

Sample Tile URL: An example tile URL, constructed using the URL prefix, addressing scheme, and suffix, is displayed. Press the "Copy Sample Tile URL" button to copy the sample URL to the clipboard. If everything is configured correctly, you should be able to paste the URL into a web browser and have it download and display the tile image.

Zoom Level Range: In the SlippyMap standard, the scale of a map is denoted by an integer zoom level. At zoom level 0, the map displays the entire world, while at zoom level 18, individual houses are visible. Most SlippyMap servers supply maps at zoom levels from 0 to 18, although a few are limited to a different zoom range. By specifying a server's zoom level range, you prevent BaseOps from needlessly trying to download map tiles at zoom levels that the server does not supply.

Attribution Text: The terms of use for some SlippyMap servers require you to display copyright and attribution information when using their maps. Text you enter in the *Attribution Text* box will be displayed in the lower-right corner of the map by BaseOps.

Attribution Logo: In addition to attribution text, some servers also require you to display a graphical company logo. In this case, the SlippyMap server documentation will supply you with a logo image file that you can download to your computer. Enter the full path file name of this logo image in the *Attribution Logo* box. It will be displayed next to the attribution text in the lower-right corner of the map.

Presets: Once you have configured the parameters of a SlippyMap server, you can save those settings as a preset that can be accessed in the future. To create a new preset, edit the SlippyMap server parameters as desired, then press the Save as New Preset button. You will be prompted for a name for the new preset.

If you edit the parameters of an existing preset, press the Update Preset button to update the preset with the new settings. Press the Rename Preset and Delete Preset buttons to rename and delete the preset currently displayed in the drop-down preset list.

Show map only at SlippyMap zoom levels: BaseOps can display a SlippyMap at any map scale; data from the closest SlippyMap zoom level is used. However, SlippyMap maps are designed to be displayed with an exact 1:1 correspondence between a map tile image's pixels and your computer monitor's pixels. Displaying them at other map scales can result in reduced legibility.

If the "Show map only at SlippyMap zoom levels" box is checked, then when displaying maps that include SlippyMap data, BaseOps will only display them at the exact scales corresponding to SlippyMap zoom levels.

Note that this setting is a global application-wide option.

Show SlippyMap debug data: If this box is checked, information about the status of the SlippyMap map layer will be displayed in the lower-left corner of the map. Data displayed includes the map's current zoom level and the number of SlippyMap tiles currently being downloaded.

Note that this setting is a global application-wide option.

9.6.2. Technical Details

BaseOps can display SlippyMap tile images delivered in either .png or .jpg format.

SlippyMap maps use the Web Mercator map projection.

Downloaded SlippyMap map tile images are cached on your hard drive for reuse. This greatly increases performance, as the map data for a particular region and zoom level only needs to be downloaded once. To prevent the disk cache from growing too large, the map tile files will be deleted approximately 60 days after they are downloaded. See *Section B.15, Cache Options*, for more information.

Chapter 10

Setting Core Case Properties

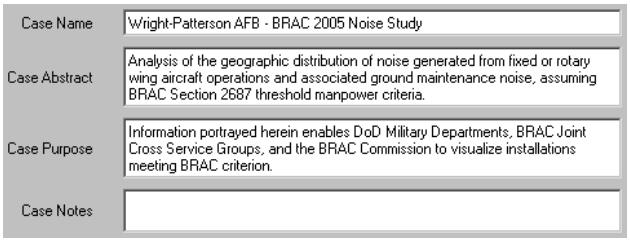
After creating a new BaseOps case, your first task should be setting the core case properties. Core case properties can affect how the rest of a case's data is entered.

In the list pane, choose Case from the object type selector dropdown list. Then set the properties in the text pane.

Tip:

BaseOps can import some core case properties from DAFIF. See the instructions for importing airfield information in *Chapter 26, Importing Information from DAFIF*.

10.1. Case Information



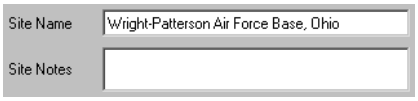
The *Case Name* is a short (60 characters maximum) description of a BaseOps case, such as "Wright-Patterson Air Force Base 1990 Noise Study". It should unambiguously identify the case.

The *Case Abstract* is a narrative summary of a BaseOps case. It describes the "what" aspects of the case. There is no restriction on the length of the abstract. Press the Enter key to insert additional lines.

The *Case Purpose* is a brief description of the reason that a BaseOps case was created. It describes the "why" aspects of the case. There is no restriction on the length of the description. Press the Enter key to insert additional lines.

Use the *Case Notes* to store miscellaneous information about a case. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

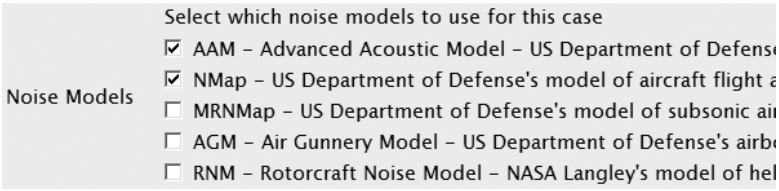
10.2. Site Information



The *Site Name* is a short (60 characters maximum) description of the location being modeled by a BaseOps case. Typically, this will be an airfield name, such as "Wright-Patterson Air Force Base". However, it may also be the name of a region, such as "Boston Metropolitan Area" or "NAS Oceana and Associated Outlying Airfields".

Use the *Site Notes* to store miscellaneous information about a site. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

10.3. Noise Models



BaseOps supports the following noise models:

- AAM, the Advanced Acoustical Model, the next-generation model of aircraft flight noise developed jointly by the US Department of Defense and NASA
- NMap, the US Department of Defense's model of aircraft flight and run-up noise near air bases
- MRNMap, the US Department of Defense's model of subsonic aircraft noise from Military Operations Area (MOA) and Military Training Route (MTR) operations
- AGM, the US Department of Defense's model of noise from airborne weaponry operations

- RNM, the Rotorcraft Noise Model, NASA Langley's model of helicopter and tilt-wing aircraft noise

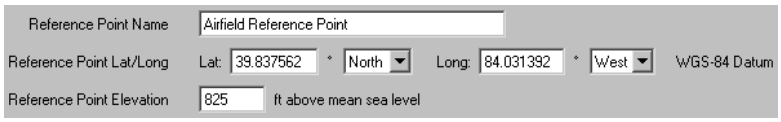
Check the box next to each noise model that you wish to use as part of this BaseOps case. At least one model must be selected.

When you run the case, BaseOps runs each of the selected noise models. If more than one model is selected, BaseOps creates a combined noise grid containing the summed noise from all of the selected models.

Note:

BaseOps hides sections of the user interface that are not relevant to the selected noise models. For example, airspace profiles are only relevant to MRNMap. If you don't select the MRNMap noise model, then BaseOps hides the section of the user interface that allows airspace profiles to be edited.

10.4. Reference Point



The reference point is a well-defined location associated with a BaseOps case. The latitude, longitude, and elevation of the reference point must be known, and the point should be easily identifiable on maps.

The reference point serves as the origin of the local X-Y coordinate system used by the noise models. As such, it should be located near the center of the case's area of interest.

Tip:

The center of one end of a major runway is often a good reference point.

The reference point has the following properties.

- *Reference Point Name* - Type a short (60 characters maximum) description of the reference point: for example, "Centerline, Beginning of Runway 32".

- *Reference Point Lat/Long* - Specify the horizontal coordinates of the reference point, in degrees of latitude and longitude, using the WGS-84 datum.

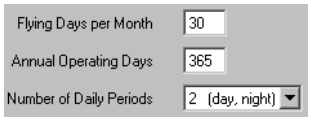
☞ ***Note:***

The reference point location must be specified using latitude and longitude, regardless of the current case coordinate system. This is because the case coordinate system can be defined in terms of the reference point (for example, feet east and north of the reference point). Thus, allowing the reference point to be specified in the case coordinate system could cause a circular reference.

- *Reference Point Elevation* - Type the elevation (above mean sea level) of the ground at the site reference point. See *Section 4.9, Setting the Case's Physical Units*, for information on selecting the units used to specify elevations.

  The reference point elevation is used to convert between AGL (above ground level) and MSL (mean sea level) heights in a BaseOps case. It is also used as the default ground elevation when NMap, AAM, and RNM are run without elevation data.

10.5. Operations



The *Flying Days per Month* and *Annual Operating Days* are the average number of days per month and year, respectively, on which aircraft typically operate at the principal airfield being modeled by the BaseOps case. For airfields that operate continuously, 30 days per month and 365 days per year are typically used. The monthly average is used by the MRNMap noise model. The yearly average is used by NMap, AAM, AGM, and RNM. These data entry fields may be hidden, depending on which noise models you selected: see *Section 10.3, Noise Models*.

The *Number of Daily Periods* specifies the number of periods into which a 24-hour day is partitioned for the purpose of noise modeling. This allows the noise models to give some consideration to the time at which noise events occur (events that occur at night are considered more significant, due to their greater potential to annoy).

The number of daily periods is determined by the noise metric (DNL or CNEL) being used, which in turn is generally determined by the applicable laws governing the site being modeled.

You have two choices for the number of daily periods.

- *2 (day, night)* - Two periods are used: day (for aircraft operations between 0700 and 2200 hours local time) and night (for operations before 0700 or after 2200 hours).

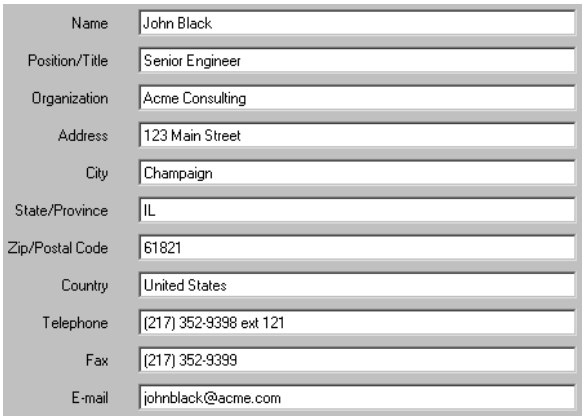
- *3 (day, evening, night)* - Three periods are used: day (for aircraft operations between 0700 and 1900 hours local time), evening (for operations between 1900 and 2200 hours) and night (for operations before 0700 or after 2200 hours).

10.6. Magnetic Declination

The *Magnetic Declination* is the difference between true and magnetic north at the location being modeled by a BaseOps case. It is specified in decimal degrees.

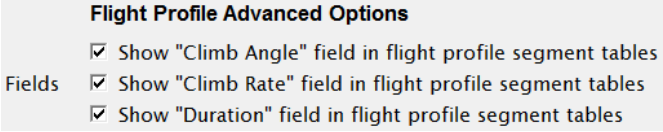
The current magnetic declination is indicated by BaseOps' north arrow: see *Section 3.5, North Arrow*.

10.7. Contact Information



The requested contact information identifies the person or organization that is responsible for a BaseOps case. All of the information is typed as freeform text; there are no restrictions on what can be typed into each of the text boxes.

10.8. Flight Profile Advanced Options



The Flight Profile Advanced Options section pertains only to those noise model that use flight profiles. This section is hidden unless one or more of those noise models is selected: see *Section 10.3, Noise Models*.

Use the check boxes to select which optional fields are displayed when editing or viewing flight profile segment tables. See *Section 18.6, Segments*, for more information about these fields.

10.9. AAM Advanced Options

The AAM Advanced Options section pertains only to the AAM noise model. This section is hidden unless that noise model is selected: see *Section 10.3, Noise Models*.

For non-helicopter AAM aircraft (such as the fixed-wing vectored thrust F-35 and the tilt-rotor V-22 Osprey), accurate values for the angle of attack and the yaw angle are difficult to obtain. Under realistic flying conditions, these values rarely depart significantly from zero, so by default, BaseOps assumes zero for these parameters, and hides the portions of the BaseOps user interface where these parameters are edited and/or displayed. Most uses should leave these parameters locked at zero.

If you have specialized needs, you can check the box labeled *Allow editing of attack and yaw angles for non-helicopter AAM aircraft*. This will display the sections of the BaseOps user interface where these parameters can be edited.

Chapter 11

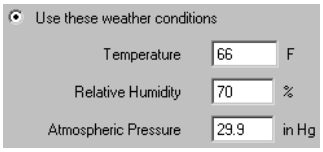
Setting Weather Conditions

Weather conditions are an important part of a BaseOps case. Temperature, relative humidity, and atmospheric pressure strongly influence the absorption of sound by the atmosphere. This in turn influences the noise levels throughout your area of interest.

To set your case's weather conditions, first choose Weather from the object type selector dropdown list. Then set the weather conditions in the text pane.

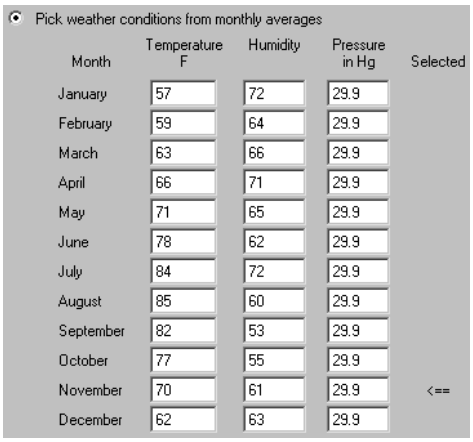
You have two choices for how to specify weather conditions.

- *Use these weather conditions*



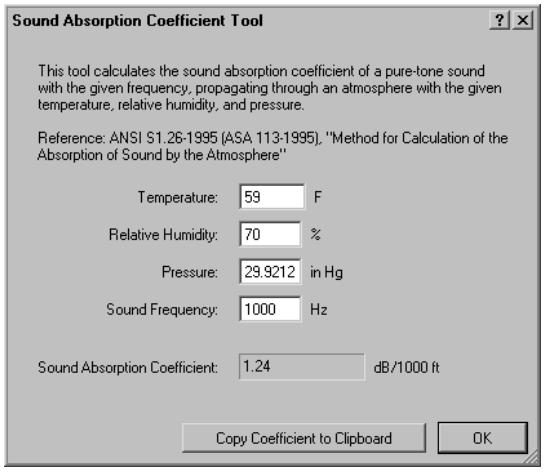
  Type the temperature, relative humidity, and atmospheric pressure that will be used when calculating noise levels.

- *Pick weather conditions from monthly averages*



Type the average temperature, relative humidity, and atmospheric pressure for each month. BaseOps will then calculate the 1,000 Hz atmospheric sound absorption coefficients for each of the 12 months, and pick the weather conditions associated with the sixth smallest coefficient. An arrow <== indicates the selected month.

Sound absorption coefficients are calculated using the method given in ANSI S1.26-1995 (ASA 113-1995), "Method for Calculation of the Absorption of Sound by the Atmosphere". Typically, you will not need to concern yourself with these calculations. However, BaseOps provides a tool that you can use, if necessary, to manually calculate sound absorption coefficients. Choose Sound Absorption Coefficient Tool from the Tools menu. The Sound Absorption Coefficient Tool dialog box appears.



Type the desired weather conditions and sound frequency. The corresponding sound absorption coefficient is automatically calculated and displayed.

Important:

Atmospheric pressures that you supply to BaseOps should **not** be sea-level corrected.

Note:

You can select the units used to specify temperatures, atmospheric pressures, and sound absorption coefficients. See *Section 4.9, Setting the Case's Physical Units*, for more information.

Chapter 12

Editing Elevation and Ground Impedance Data

When calculating noise levels, the NMap, AAM, AGM, and RNM noise models can consider the effects of terrain elevation and ground impedance on noise propagation. When running in terrain mode, the noise models read files that contain the ground elevation and ground impedance values at a grid of points covering the area of interest. The format of these files is described in the documentation accompanying NMap, AAM, and RNM.

BaseOps can create the elevation and ground impedance files for a BaseOps case by using data from a variety of publicly available sources.

 ***Note:***

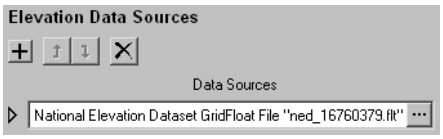
Terrain support is not optional when running the AGM noise model; it requires that the elevation and impedance grids be present.

In addition, AGM requires that the elevation, impedance, and noise calculation grids all cover the same geographic area. The easiest way to achieve this is to first set the parameters of the noise calculation grid. Then, when creating both the elevation and impedance grids, set "Grid Location and Size" to "Same as Noise Grid".

12.1. Creating an Elevation File

To work with elevation data, choose Elevation from the object type selector dropdown list. Then edit elevation data in the text pane.

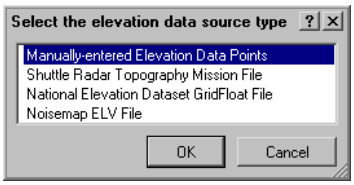
12.1.1. Elevation Data Sources



To enter elevation data, you define one or more elevation data sources. Each data source defines the ground elevation for a portion of the earth's surface.

A data source can be an external file (for example, a Shuttle Radar Topography Mission elevation file from NASA). Alternatively, an elevation data source can be a set of manually entered elevation data points.

To add a new data source, press the Add New Data Source button +. The Select Elevation Data Source Type dialog box appears.



Select the type of data source you would like to add, then press OK. The data source is added to the list. The types of data sources are described below.

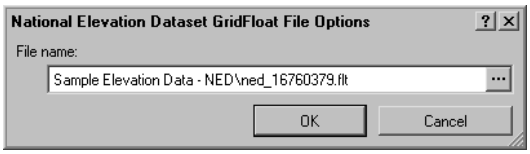
To edit a data source, press the Edit button ... next to that source. A dialog box appears that allows you to edit the data source's options. The options available will depend on the type of data source.

To delete a data source, select it by clicking on it, then either press the Delete Data Source button ×, or press Ctrl + Del.

To move a data source up or down in the list, select the data source by clicking on it, then either press the Move Up and Move Down buttons ↑ and ↓, or press Ctrl + U and Ctrl + D. The order in which data sources are listed is important. When calculating the elevation at a location, BaseOps searches the elevation data source list for the first data source that applies to that location. If two data sources overlap (i.e., if they both supply an elevation at a given location), then the elevation provided by the topmost data source in the list is used.

12.1.1.1. File Elevation Data Sources

Most of the data sources are file data source, meaning that they import data from an external file. The options dialog box for each file data source contains a box where the imported file's name is entered.



The following file types are supported:

- **Shuttle Radar Topography Mission (SRTM) File** - The Shuttle Radar Topography Mission collected elevation data using a radar system that was flown by NASA on a space shuttle mission. The coverage is worldwide between the latitudes of 56° south to 60° north.

  The data is provided as a series of files with the extension of `.hgt`. Each file covers one degree of longitude and one degree of latitude. The files follow a naming convention based upon the latitude and longitude of the southwest corner of the area covered by the file. For example, a SRTM file named `n40w095.hgt` contains elevation data for the portion of the earth's surface between 40° and 41° north latitude and between of 95° and 94° west longitude.

  As of October 2009, the latest version of the SRTM data is 2.1, and the official NASA web site for downloading version 2.1 SRTM data is http://dds.cr.usgs.gov/srtm/version2_1/. Documentation is available on this web site describing the SRTM data in detail.

- **National Elevation Dataset (NED) GridFloat File** - The National Elevation Dataset is a United States Geological Survey (USGS) product consisting of the best available elevation data. It is available for the United States and its territories.

  The data is supplied through the USGS's seamless map data server. As of January 2019, the link to the seamless server is https://viewer.nationalmap.gov/advanced-viewer/.

  The NED data is provided in several formats. BaseOps reads the GridFloat format.

  Using the seamless server website, define your area of interest and choose to download NED GridFloat data. The seamless server will create a `.zip` file for you to download. Unzip the enclosed files from the `.zip` file to a directory on your computer. Then, in BaseOps, create a NED elevation data source and select the file with the extension `.flt` from among the files you unzipped.

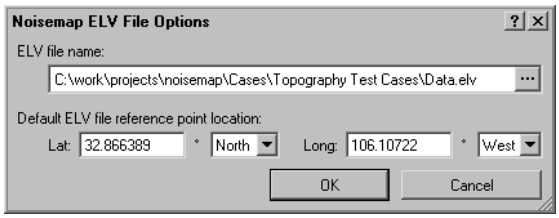
  

  Tip:

  BaseOps includes a tutorial on using the seamless map data server. Choose Tutorial from BaseOps' Help menu, then select the lesson titled "Using the USGS Seamless Map Data Server".

- **Noisemap .ELV File** - BaseOps can import legacy Noisemap `.elv` elevation files.

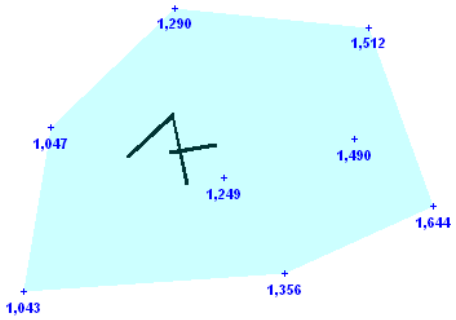
On the data source's options dialog box, in addition to the name of the `.elv` file, you must also specify the longitude and latitude of the reference point that was used when the `.elv` file was created.



12.1.1.2. Manual Elevation Data Source

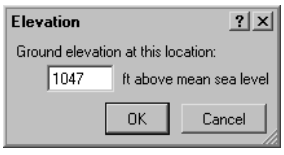
A manual elevation data source allows you to define the ground's elevation by manually entering elevation points on a map. This allows you to specify elevation data when no external data is available for import. It also allows you to selectively override portions of imported elevation data.

When a manual elevation data source is selected, all of its data points are displayed in the map pane. Use the mouse to add/edit elevation data points on the map.



The region covered by the manual data source consists of the convex hull surrounding all of the points you have defined. This area is tinted with light blue on the map. Using interpolation, BaseOps can calculate the elevation at any location inside the blue-tinted area.

To add a data point, select the Add mouse tool, then click on the map. The Elevation dialog box will appear.



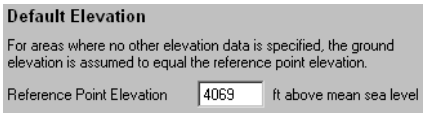
Enter the ground elevation at the new data point's location, then press OK. You can change the units used to specify the elevation: see *Section 4.9, Setting the Case's Physical Units*.

To move a point, drag it using the Select and Edit mouse tool .

To change a existing point's elevation, double-click on it using the Select and Edit mouse tool.

To delete a point, select it using the Select and Edit mouse tool, then press Ctrl + Delete.

12.1.2. Default Elevation

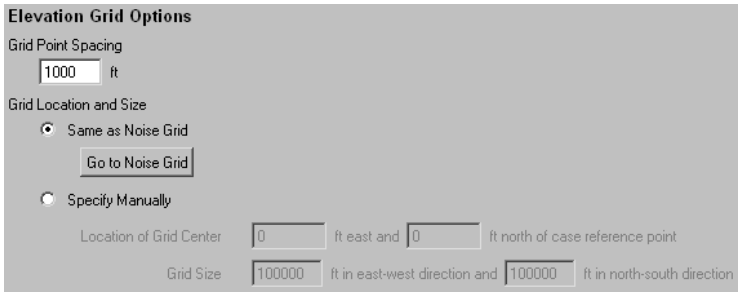


For areas where no elevation data source applies, the ground elevation is assumed to equal the reference point elevation.

Note:

The reference point elevation can also be edited in the Reference Point section of the Case page.

12.1.3. Elevation Grid Options



Elevation information is supplied to the NMap, AAM, and RNM noise models using an elevation grid file, which contains the ground elevations at a grid of regularly spaced locations. You can choose the geographic area covered by this grid, and its resolution.

The *Grid Point Spacing* is the distance between adjacent grid points (i.e., the grid resolution). Smaller distances increase the ability of the grid to resolve detailed topographic features, but increase noise model run times.

The *Grid Location and Size* controls the geographic area covered by the elevation grid. Typically, you will want the elevation grid to completely cover the noise calculation grid.

You have two choices for how to specify the grid location and size.

- *Same as Noise Grid* - The elevation grid will cover the same geographic area as the noise calculation grid. Press the *Go to Noise Grid* button to view and edit the noise grid properties.

- *Specify Manually* - In the boxes provided, enter the location and size of the elevation grid.

  In the *Location of Grid Center* boxes, type the coordinates of the center of the grid, specified with respect to the case reference point. Typically, the reference point is located near the center of the area of interest, so the grid center location will usually be close to (0, 0).

  ☞ ***Note:***

  The grid location is always specified with respect to the case reference point, regardless of the current case coordinate system.

  In the *Grid Size* boxes, type the dimensions of the elevation grid in the east-west and north-south directions.

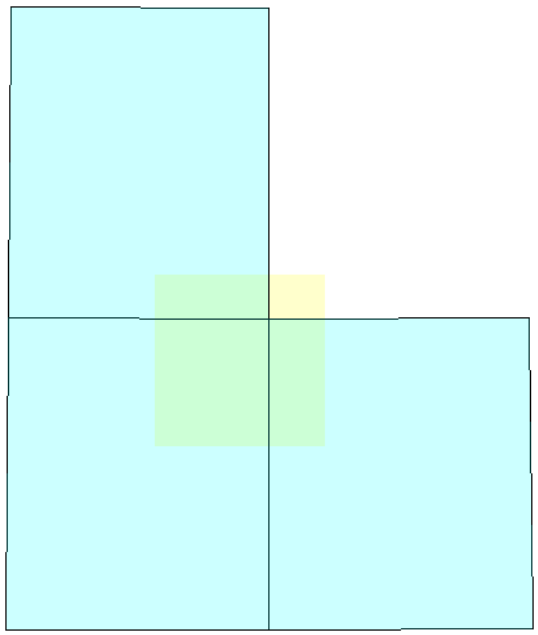
☞ ***Note:***

You can change the units used to specify distance: see *Section 4.9, Setting the Case's Physical Units*.

12.1.4. Map Display

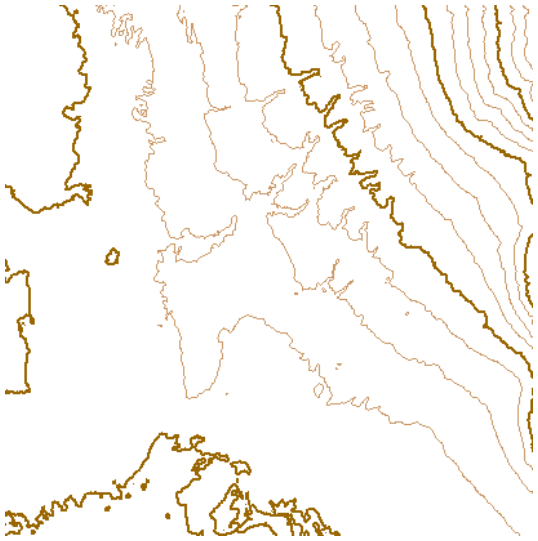
You can choose what is displayed in the map pane when editing elevation data. You have two choices.

- *Display data sources on map* - BaseOps displays the area covered by each elevation data source, tinted in light blue. The area covered by the elevation grid is also displayed, tinted in yellow.



In this example, there are three elevation data sources, covering the northwest, southwest, and southeast potions of the elevation grid. The northeast portion of the elevation grid is not covered by any data source. In that area, the default reference point elevation will be used when constructing the elevation grid. Typically, you will want the entire elevation grid covered by a data source, so you would probably want to add another data source that covers the northeast area.

- *Display elevation grid on map* - BaseOps display the calculated elevation grid on the map using contours.



The elevation grid will be displayed only if there is an up-to-date elevation grid available. If you have not created the elevation grid yet, or if you have edited the elevation grid data since last creating the grid, then the map will display a note reminding you to create the elevation grid.

 ***Note:***

When an elevation data source is selected, the map pane always displays the geographic limits of that particular data source.

12.1.5. Create Elevation Grid

Once you have defined the elevation data sources and set the elevation grid options, press the Create Elevation Grid button. BaseOps will read each of the file data sources, perform any necessary calculations, and write the elevation grid file.

The elevation grid file will be named `CASENAME.elv`, where `CASENAME` is the name of the `.baseops` case file. When the elevation grid is created, BaseOps will automatically enter this file name into the Elevation File section of the Run options. See *Section 32.4.4, Elevation and Ground Impedance*, for more information.

After creating the elevation grid, BaseOps will automatically set the Map Display option to *Display elevation grid on map*, so that the elevation grid contours are displayed on the map.

 ***Important:***

If you create the elevation grid, then edit any of the elevation grid data, press the Create Elevation Grid button again to update the elevation grid.

12.2. Creating a Ground Impedance File

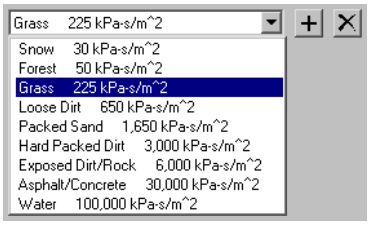
Creating a ground impedance file is similar to creating an elevation file. Therefore, only the differences will be described here. You should read *Section 12.1, Creating an Elevation File*, before reading this section.

12.2.1. Entering Ground Impedance Values

Ground impedance is a measure of how acoustically soft or hard the ground cover is at a location. Water, for example, is acoustically hard compared to, say, a grass-covered field, so sound will propagate with less attenuation across water.

Typically, you will not know the precise numeric value of the ground impedance at a particular location. Rather, you will know the type of ground cover (for example, bare rock, or deciduous forest).

In BaseOps, you specify ground impedance values by using a drop-down control to select from a list of ground covers.



BaseOps ships with a library of common ground covers. You can edit this library. To add a new ground cover to the library, press the Add button +. The Add New Ground Cover dialog box appears.

In the boxes provided, enter a descriptive name for the ground cover, and the corresponding ground impedance value in units of kPa-s/m^2.

Important:

In older versions of some noise modeling literature, the units of ground impedance have been erroneously referred to as rayl. This is incorrect. This correct units are kPa-s/m^2, which is equivalent to the units of rayl/m.

To remove a ground cover from the library, select it in the dropdown control, then either press the Delete button ×, or press Ctrl + Del.

12.2.2. File Ground Impedance Data Sources

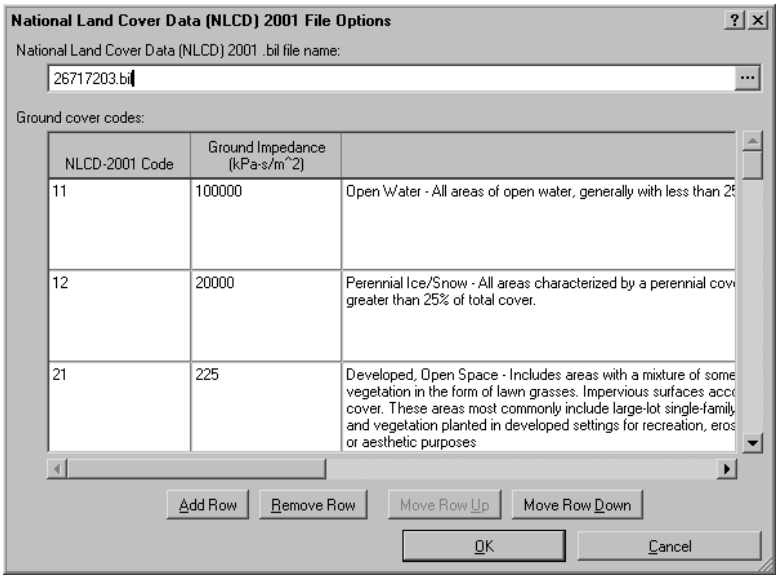
BaseOps can import ground impedance data from external files. The following file types are supported:

- **National Land Cover Data (NLCD) 2001 .bil File** - National Land Cover Data is a United States Geological Survey (USGS) product consisting of the best available land cover data.

  The data is supplied through the USGS's seamless map data server. As of January 2019, the link to the seamless server is https://viewer.nationalmap.gov/advanced-viewer/.

  Using the seamless server website, define your area of interest and choose to download "NLCD 2001 Land Cover" data in the BIL format. The seamless server will create a `.zip` file for you to download. Unzip the enclosed files from the `.zip` file to a directory on your computer. Then, in BaseOps, create a NLCD ground impedance data source and select the file with the extension `.bil` from among the files you unzipped.

  BaseOps ships with a table mapping each of the NLCD land cover codes to a reasonable ground impedance value. You can view and, if desired, edit this table.



  In the Ground Impedance column, enter the desired ground impedance value associated with each of the NLCD ground cover codes. The description of each ground cover code, as supplied by the USGS, is displayed for reference.

- **Digital Line Graph (DLG) Hydrography (HYF) File** - Digital Line Graph (DLG) is a map data format developed by the United States Geological Survey (USGS) for storing vector map data. The DLG standard defines several categories of map data, including the hydrography (HYF) category, which pertains to water features. BaseOps can read DLG

hydrography files and assign appropriate ground impedance values to those areas where a water feature is present.

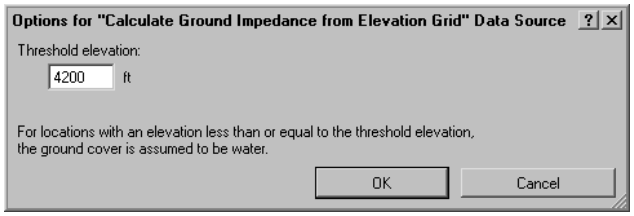
BaseOps can read 1:24000 and 1:100000 scale, level 3, optional format UTM DLG files. As of October 2009, the most convenient way to obtain DLG data for the United States was through the WebGIS website at http://www.webgis.com/. Choose to download Digital Line data in the Standard (UTM) format. On the map, drill down to the state and then county desired, then download each of the hydrography DLG files, which will be compressed in a `.zip` file. Unzip the enclosed `.opt` file from each `.zip` file to a directory on your computer. Then, create a DLG ground impedance data source for each `.opt` file.

You will also need to specify the geographic datum for each DLG file. For DLG files created by the USGS, the datum will be North American 1927.

- **Noisemap .IMP File** - BaseOps can import legacy Noisemap `.imp` ground impedance files. These are similar to Noisemap `.elv` files. See *Section 12.1.1.1, File Elevation Data Sources*, for more information.

12.2.3. "Calculate From Elevation Grid" Ground Impedance Data Source

A "calculate from elevation grid" ground impedance data source analyzes the elevation grid to determine ground impedance values. In the options dialog box for this data source, a threshold elevation is specified.



For locations where the elevation is less than or equal to the threshold elevation, the ground cover is assumed to be water, and a ground impedance value of 100,000 kPa-s/m^2 is used.

For locations where the elevation is greater than the threshold elevation, no ground impedance values are supplied by this data source. For these locations, BaseOps will search for other applicable data sources in the data source list. If none are found, the default ground impedance is used.

If a "calculate from elevation grid" ground impedance data source is used, then the elevation grid must be available when the ground impedance grid is created. See *Section 12.1, Creating an Elevation File*, for more information.

Tip:

The "calculate from elevation grid" ground impedance data source is useful for airfields located near large bodies of water (the ocean, or large lakes) where no source of more detailed ground cover data is available.

12.2.4. Manual Ground Impedance Data Sources

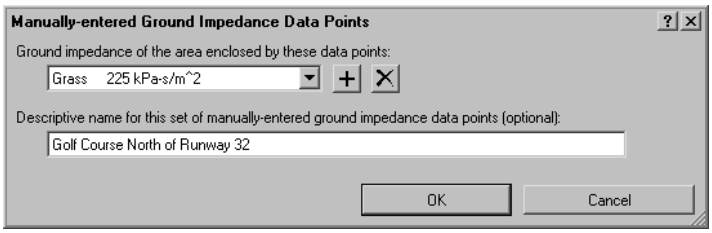
A manual ground impedance data source allows you to manually define areas with a particular ground cover by clicking on the map pane. There are similarities to a manual elevation data source, but there is one important difference.

In a manual elevation data source, each point you add specifies the elevation at that point. BaseOps then interpolates to find intermediate elevations between those points.

In a manual ground impedance data source, you define a single ground impedance value for the entire data source. The points you add on the map define one or more polygons enclosing the area where that ground impedance value applies. BaseOps does not interpolate to find intermediate ground impedance values. Typically, this is what you want. Unlike elevation, which usually varies smoothly, ground impedance values usually vary in a stepwise fashion. For example, consider a parking lot surrounding by a grass lawn. At the edge of the parking lot, the ground cover changes instantaneously from grass to concrete.

There are occasional situations where ground impedance does change gradually. For example, a lake in the middle of a grassy field may have a reedy boundary with a ground impedance intermediate between water and grass. If such areas are large enough to be significant, they can be dealt with by defining a new ground cover representing the reedy area.

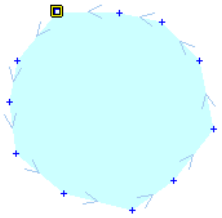
After adding a new manual ground impedance data source, the data source's options dialog box appears.



Select the ground cover for this data source and, optionally, provide a descriptive name describing the source. Then use the mouse to add ground impedance data points on the map. The points define one or more polygons enclosing the area that has the ground cover you selected.

To add a point, select the Add mouse tool, then click on the map. The new point will be added to the current polygon. To begin a new polygon, hold down the Shift key while you click.

Arrowheads indicate each polygon's direction. It is important to know a polygon's direction when you add a point to it — the new point is added directly after the selected point. The selected point is highlighted in yellow. To select a point, click on it using the Select and Edit mouse tool.



To move a point, drag it using the Select and Edit mouse tool.

To delete a point, select it using the Select and Edit mouse tool, then press Ctrl + Delete.

12.3. Determining Elevation and Ground Impedance Values at a Location

If the mouse is over the map pane, the elevation and ground impedance values at the mouse's location are displayed on the status bar. See *Section 3.4, Status Bar*, for more information.

If the elevation and/or ground impedance grids have not been created (or if they are out of date), then the default elevation and/or ground impedance values are displayed.

Chapter 13

Editing Point Objects

Many of the objects in a BaseOps case represents point locations. These include:

- **Navigational Aids** - Visual or electronic devices used to guide aircraft along their intended flight paths. Navigational aids serve as anchors for radials and DME arcs: see *Chapter 15, Editing Radials and DME Arcs*. They are also displayed on maps to aid in the editing of flight tracks and flight profiles: see *Chapter 17, Editing Flight Tracks*, and *Chapter 18, Editing Flight Profiles*.

- **Waypoints** - Named geographic reference points used by aircraft in navigating their routes. Since flight paths are often specified with respect to waypoints, it can be useful to display waypoints on maps when editing flight tracks and flight profiles: see *Chapter 17, Editing Flight Tracks*, and *Chapter 18, Editing Flight Profiles*.

- **Points of Interest** - Locations of special interest where a detailed noise analysis will be performed. Typically, these are locations with a heightened sensitivity to noise, such as hospitals and schools. See *Section 32.4.2, Computations Performed*.

- **VTOL Pads** - Locations where vertical-takeoff-and-landing (VTOL) aircraft can takeoff and land. VTOL pads (also known as helipads) are often used as the anchors for flight tracks: see *Chapter 17, Editing Flight Tracks*. VTOL pads are used by the AAM and RNM noise model.

- **Static Pads** - Designated locations on an airfield where aircraft engines are run during maintenance and repair work. Static pads serve as the anchors for static profiles: see *Chapter 23, Editing Static Profiles*. Static pads are used by the NMap and AAM noise models.

- **Targets** - Locations at which airborne gunnery fire is directed. Targets serve as anchors for AGM attack runs: see *Chapter 22, Editing Attack Runs*.

Tip:

BaseOps can import waypoints, navigational aids, and VTOL pads from DAFIF. See *Chapter 26, Importing Information from DAFIF*.

The different types of point objects are all edited in a similar manner. Therefore, only navigational aids will be discussed in detail. Keep in mind, however, that the following instructions (with the exception of the navaid type) also apply to other point objects.

To work with navigational aids, choose Navigational Aids from the object type selector dropdown list. Navigational aids can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*. You can use the Add mouse tool to add new navigational aids by clicking on the map; see *Section 6.4, The Add Mouse Tool*.

To edit a navigational aid, first select it in the object list, then edit its properties in the text pane.

Navigational aids have the following properties.

- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the navigational aid.

- *Long Name* - A one-line (80 characters maximum) name for the navigational aid. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.

- *Notes* - Miscellaneous information about the navigational aid. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

- *Location* - The location of the navigational aid. You can change the coordinate system used to specify locations: see *Section 4.8, Setting the Case Coordinate System*.

  Using the Select and Edit map tool, you can drag the navigational aid to another location on the map. See *Section 6.3, The Select and Edit Mouse Tool*, for more information.

- *NavAid Type* - The type (VOR, TACAN, DME, etc.) of the navigational aid. Specifying the type is not strictly necessary. However, doing so is useful for documentation purposes, and

future versions of BaseOps may allow you to display different types of navigational aids using different map symbols.

The navigational aid types are defined in the NavAid Type group: see *Chapter 25, Using Groups*. If desired, you can add additional types.

 ***Note:***

If the AAM and/or the NMap noise models are selected, Points of Interest will have two additional properties: the noise level reductions when windows are open and closed. These properties are used when calculating the Probability of Awakening noise metric. Suggested default values are 15 dB for windows open and 25 dB for windows closed, which correspond to national averages for residential construction per FICAN 1992.

Chapter 14

Editing Runways

Runways serve an important purpose in BaseOps: they are anchors for flight tracks. The location and orientation of a flight track depends on the location and heading, respectively, of the track's runway.

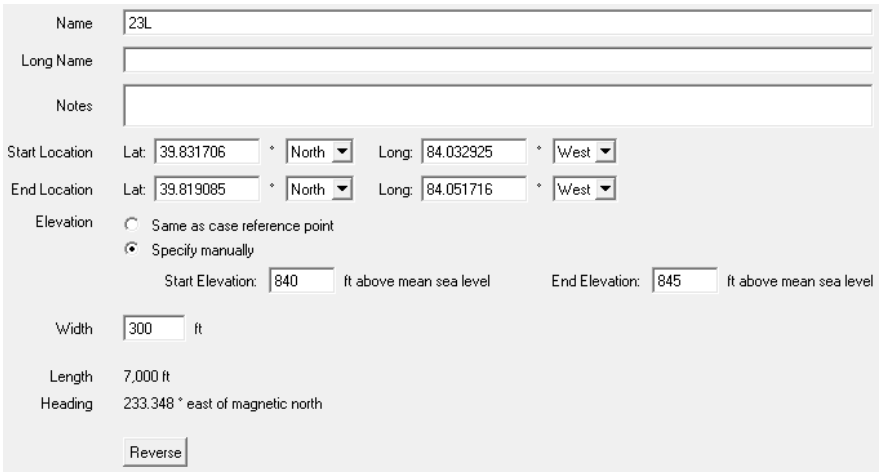
Runways are used by the NMap, AAM, and RNM noise models. Unless one of these models is selected, the parts of the BaseOps user interface dealing with runways will be hidden. See *Section 10.3, Noise Models*.

To work with runways, choose Runways from the object type selector dropdown list. Runways can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

Tip:

BaseOps can import runways from DAFIF. See *Chapter 26, Importing Information from DAFIF*.

To edit a runway, first select it in the object list, then edit its properties in the text pane.



Runways have the following properties.

- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the runway.

- *Long Name* - A one-line (80 characters maximum) name for the runway. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.

- *Notes* - Miscellaneous information about the runway. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

- *Start Location* -
  End Location - The location of the runway centerline at the beginning and end of the runway, not counting any overrun areas.

  You can change the coordinate system used to specify locations: see *Section 4.8, Setting the Case Coordinate System.*

  Using the Select and Edit map tool, you can drag a runway endpoint to another location on the map. See *Section 6.3, The Select and Edit Mouse Tool*, for more information.

   ***Note:***

  Displaced runway thresholds are incorporated into flight profiles. See the discussion of the *displacement* parameter in *Chapter 18, Editing Flight Profiles*.

   ***Important:***

  It is critical that runway locations be entered accurately and with sufficient precision. Since a flight track's initial direction is determined by its runway, a small error in the runway's heading will result in substantial location errors in the portions of the flight track that are far from the runway.

- *Start Elevation* -
  End Elevation - The elevations, with respect to mean sea level, of the runway centerline at the beginning and end of the runway, not counting any overrun areas.

  You can manually enter the elevations, or else choose to use the elevation of the case reference point: see *Section 10.4, Reference Point*.

  You can change the units used to specify the elevations: see *Section 4.9, Setting the Case's Physical Units*.

- *Width* - The width of the runway. The width is not used when calculating noise levels, but BaseOps uses it when drawing runways on maps.

- *Length* -
  Heading - The length and heading of the runway, calculated from the endpoint locations.

Tip:

You can double-check a runway's endpoints by comparing the calculated length and heading with published values (from, say, a FLIP chart).

Press the Reverse button to swap the runway endpoints and modify the runway name so that it refers to the opposite runway (for example, changing 23L to 05R). The name is not changed if it does not follow standard runway naming conventions (two digits referring to the heading, optionally followed by 'L', 'C', or 'R').

Tip:

After adding a runway, you can easily add the opposite runway to the BaseOps case by following these steps.

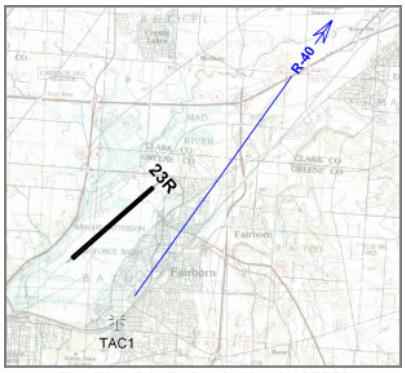
1. Press the Duplicate button on the list pane to create a copy of the first runway.

2. Press the Reverse button to change the copy into the opposite runway.

Chapter 15

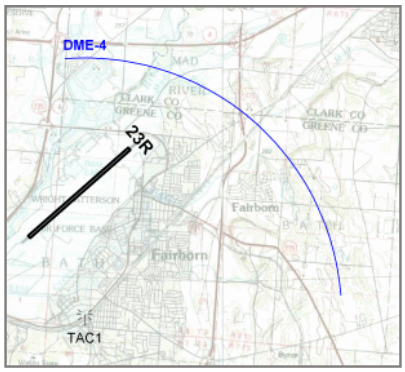
Editing Radials and DME Arcs

A *radial* is a line on a map that begins at a navigational aid and continues indefinitely along a specified heading.



The 40° radial off of navigational aid TAC1

A *DME arc* is a full or partial circle on a map that is centered on a navigational aid.



The 4 nautical mile DME arc off of navigational aid TAC1.
The arc begins at a heading of 0° and continues for 90° clockwise.

Radials and arcs are often used to define portions of flight tracks (for example, begin a turn when the track intersects a particular radial) and flight profiles (for example, begin a descent when a particular DME arc is reached).

BaseOps allows you to add radials and DME arcs to the maps of flight tracks and flight profiles. This involves three steps.

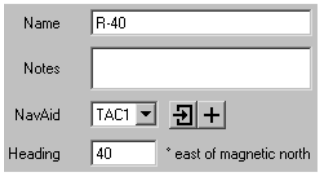
1. If it does not already exist, add the navigational aid that anchors the radial or arc. See *Chapter 13, Editing Point Objects*.

2. If it does not already exist, create the radial or arc as described in this chapter.

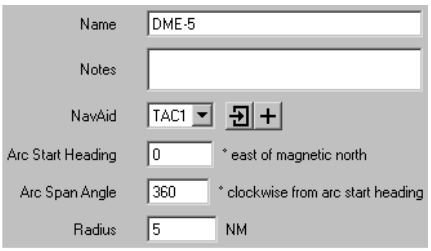
3. Add the radial or arc to the map of the flight track or flight profile, as described in *Section 7.2, Annotating Maps with BaseOps Objects*.

To work with radials or DME arcs, choose Radials or Arcs, respectively, from the object type selector dropdown list. Radials and arcs can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit a radial or arc, first select it in the object list, then edit its properties in the text pane.



Editing a radial



Editing a DME arc

Both radials and arcs have the following properties.

- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the radial or arc.

- *Notes* - Miscellaneous information about the radial or arc. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

- *NavAid* - The navigational aid that anchors the radial or arc. Select the navigational aid from the dropdown list. Press the Add Navigational Aid button + to add a new navigational aid. Press the Go To Navigational Aid button to edit the selected navigational aid.

Radials have the following additional properties.

- *Heading* - The direction of the radial as seen from the navigational aid, expressed in degrees east of magnetic north.

DME arcs have the following additional properties.

- *Arc Start Heading* - The direction of the beginning of the arc, as seen from the navigational aid, expressed in degrees east of magnetic north.

- *Arc Span Angle* - The length of the arc, in degrees clockwise from the beginning. For DME circles, specify a span angle of 360°.

- *Radius* - The radius of the arc.

  You can change the units used to specify the radius: see *Section 4.9, Setting the Case's Physical Units*.

Chapter 16

Editing Avoidance Areas

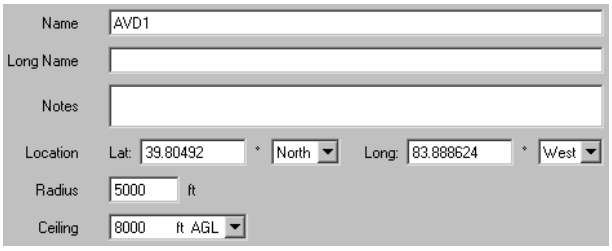
An *avoidance area* is a cylindrical-shaped portion of airspace where aircraft operations are prohibited.

A sample avoidance area, named AVD1.

Avoidance areas are an integral part of an MRNMap case, denoting portions of military operations areas where aircraft do not fly. The other noise models do not use avoidance areas, but since flight operations are often constrained by them, it may still be useful to display them on BaseOps maps: see *Section 7.2, Annotating Maps with BaseOps Objects*.

To work with avoidance areas, choose Avoidance Areas from the object type selector dropdown list. Avoidance areas can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit an avoidance area, first select it in the object list, then edit its properties in the text pane.



Avoidance areas have the following properties.

- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the avoidance area.

- *Long Name* - A one-line (80 characters maximum) name for the avoidance area. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.

- *Notes* - Miscellaneous information about the avoidance area. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

- *Location* - The location of the center of the avoidance area.

  You can change the coordinate system used to specify locations: see *Section 4.8, Setting the Case Coordinate System*.

  Using the Select and Edit map tool, you can drag the center of the avoidance area to another location on the map. See *Section 6.3, The Select and Edit Mouse Tool*, for more information.

- *Radius* - The radius of the avoidance area.

  You can change the units used to specify the radius: see *Section 4.9, Setting the Case's Physical Units*.

- *Ceiling* - The height of the top of the avoidance area. Type the height, then select whether the height is above ground level (AGL) or above mean sea level (MSL).

  Aircraft are permitted to fly over the avoidance area if they are higher than the area's ceiling. The bottom of the avoidance area is always ground level.

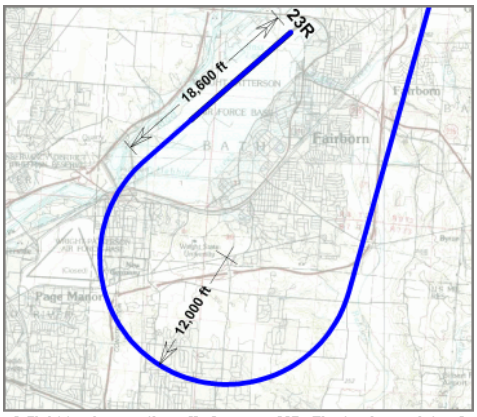
  You can change the units used to specify the height: see *Section 4.9, Setting the Case's Physical Units*.

Chapter 17

Editing Flight Tracks

A flight track is a two-dimensional representation of an aircraft's flight path. Essentially, it is a line along the ground that defines the horizontal (but not vertical) component of the flight path.

In BaseOps, flight tracks are defined as a sequence of one or more straight and curved segments. Every flight track has an associated runway or VTOL pad that defines the track's starting location and (for runways) initial heading.



A flight track operating off of runway 23R. The track consists of three segments: a 18,600 ft straight segment, a 210° left turn with a radius of 12,000 ft, and a final 300,000 ft straight segment.

There are four types of flight tracks.

- **Arrival** - Arrival flight tracks represents the paths of aircraft that arrive from outside the noise study area and land on a runway or VTOL pad.
- **Departure** - Departure flight tracks represents the paths of aircraft that take off from a runway or VTOL pad and then depart the noise study area.
- **Closed Pattern** - Closed pattern flight tracks represent the paths of aircraft that are performing touch-and-go operations on a runway.
- **Interfacility** - Interfacility flight tracks represent the paths of aircraft that takeoff and land on different runways or VTOL pads in the noise study area.

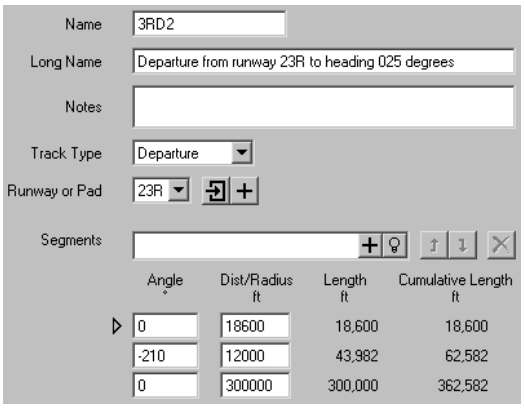
Important:

Arrival flight tracks are defined in reverse. That is, the first segment of an arrival (the one anchored to the destination runway) is the last segment that would be flown by an aircraft.

Flight tracks are used by the NMap, AAM, and RNM noise models. Unless one of these models is selected, the parts of the BaseOps user interface dealing with flight tracks will be hidden. See *Section 10.3, Noise Models*.

To work with flight tracks, choose Flight Tracks from the object type selector dropdown list. Flight Tracks can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit a flight track, first select it in the object list, then edit its properties in the text pane.



Flight tracks have the following properties.

- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the flight track.
- *Long Name* - A one-line (80 characters maximum) name for the flight track. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.
- *Notes* - Miscellaneous information about the flight track. There is no restriction on the length of notes. Press the Enter key to insert additional lines.
- *Track Type* - The flight track type (Arrival, Departure, Closed Pattern, or Interfacility). See above.
- *Runway or Pad* - The runway or VTOL pad that defines the flight track's starting location and (for runways) initial heading. Select the runway or pad from the dropdown list. Press

the Add Runway or Pad button + to add a new runway or pad. Press the Go To Runway or Pad button to edit the selected runway or pad.

For interfacility flight tracks, your must select both a From and a To runway or pad. The flight track location and orientation is determined by the From runway or pad. The To runway or pad is for documentation and error-checking purposes only.

Note:

NMap does not currently support VTOL pads. Therefore, any flight tracks used by NMap aircraft must be associated with runways. RNM and AAM support flight tracks associated with either runways or VTOL pads.

- *Initial Heading* - The initial heading of the first flight track segment, in degrees east of magnetic north. This property is displayed only for flight tracks that are associated with a VTOL pad (for flight tracks associated with a runway, the runway defines the initial heading).

- *Segments* - The straight and curved line segments that make up the flight track. Segments are presented in a table.

  For straight segments, Angle is zero, and Dist/Radius is the length of the segment.

  For curved segments, Angle is the angle of the curve, and Dist/Radius is the curve radius. Angle is negative for left turns and positive for right turns.

  Length is the linear length of the segment, and Cumulative Length is the cumulative linear length of the track up to and including the segment. This information is useful when calculating flight profile track distances, although care must be taken to account for runway displacements. See *Chapter 18, Editing Flight Profiles*, for more information.

  You can change the units used to specify flight track dimensions: see *Section 4.9, Setting the Case's Physical Units*.

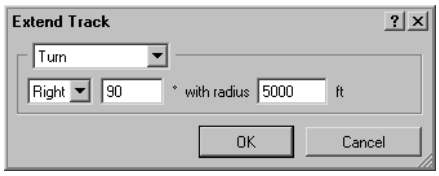
  The triangle icon indicates the selected segment. To select another segment, either click somewhere on that segment's row, or navigate to that segment using the Tab key.

  To add a new segment, either press the Add Segment button +, or press Ctrl + A. The new segment will be added directly below the selected segment.

  To delete the selected segment, either press the Delete Segment button ×, or press Ctrl + Del.

  To move the selected segment up or down in the table, press the Move Up and Move Down buttons and , or press Ctrl + U and Ctrl + D.

When you add a new segment, BaseOps displays the Extend Track dialog box, which asks for information about the type of segment you wish to add. Specify this information, then press OK.



Alternatively, you can use the quick-add feature, which lets you efficiently add segments to a flight track. To add a segment, type a quick-add command into the text box, then press the Add Segment button + or the Enter key.

The quick-add commands are somewhat cryptic, but once learned, they allow you to add segments very quickly. Frequent users will find it worthwhile spending a few minutes learning the quick-add commands. To display a list of the quick-add commands that you can use, either press the Quick-Add Hints button ?, or press Ctrl + H.

Tip:

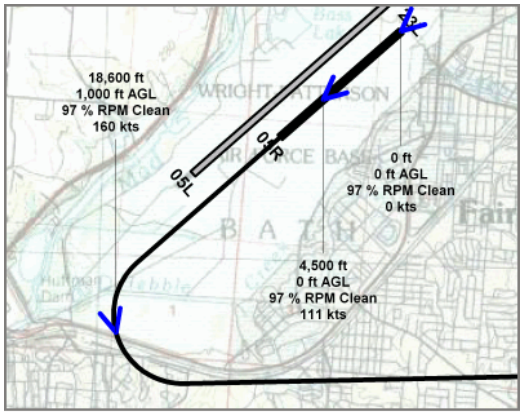
Using the Select and Edit map tool, you can graphically edit a flight track's segments. See *Section 6.3, The Select and Edit Mouse Tool*, for more information.

Chapter 18

Editing Flight Profiles

A flight profile describes the operational characteristics (height, power setting, airspeed, etc.) of an aircraft as it flies along a flight track.

In BaseOps, flight profiles are defined as a sequence of one or more *flight profile segments*: sections of a flight track where the operational characteristics are either constant or vary linearly. Each segment begins with a *profile point*: a location where the operational characteristics are specified. The location of profile points along a flight track is specified by the linear track distance, measured from the start of the track.



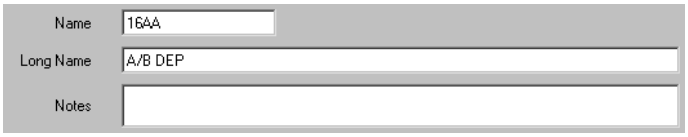
A sample flight profile with three profile points.

Flight profiles are used by the NMap, AAM, and RNM noise models. Unless one of these models is selected, the parts of the BaseOps user interface dealing with flight profiles will be hidden. See *Section 10.3, Noise Models*.

To work with flight profiles, choose Flight Profiles from the object type selector dropdown list. Flight profiles can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit a flight profile, first select it in the object list, then edit it in the text pane. Flight profiles have numerous properties. These are listed below, grouped for easy reference.

18.1. Profile Name and Notes



- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the flight profile.
- *Long Name* - A one-line (80 characters maximum) name for the flight profile. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.
- *Notes* - Miscellaneous information about the flight profile. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

18.2. Operation Counts

The operation counts specify the average number of times per calendar day that the flight profile is flown during the day, evening, and night. Note that day, evening, and night are precisely defined periods: see *Section 10.5, Operations*. The evening period will be displayed only if the number of daily periods is set to three for this BaseOps case.

18.3. Flight Track Information

- *Flight Track* - The flight track associated with this flight profile. Select the track from the dropdown list. Press the Add Flight Track button + to add a new track. Press the Go To Flight Track button to edit the selected track. See *Chapter 17, Editing Flight Tracks*, for more information.

  The length of the selected flight track is displayed.

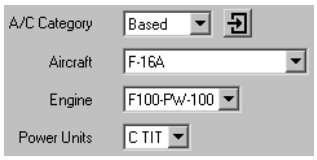
- *Displacement* - The takeoff and/or landing runway displacements associated with this flight profile. The displacements that are requested (takeoff, landing, or both) will depend on the flight track type (arrival, departure, etc.).

  The takeoff displacement is the distance, measured from the beginning of the runway, to the point where the aircraft begins its takeoff roll. For all flight track types except for arrival, the takeoff displacement is the origin from which flight profile cumulative track distances are measured.

  The landing displacement is the distance, measured from the beginning of the runway, to the point where the aircraft touches down. For arrival flight tracks, the landing displacement is the origin from which flight profile cumulative track distances are measured.

  You can change the units used to specify runway displacements: see *Section 4.9, Setting the Case's Physical Units*.

18.4. Aircraft Information



- *A/C Category* - The aircraft category is used to group flight profiles into broad categories. Specifying the category is not strictly necessary. However, doing so is useful for organizational and documentation purposes.

  The categories are defined in the A/C Category group: see *Chapter 25, Using Groups*. If desired, you can add additional categories.

- *Aircraft* - The aircraft associated with this flight profile. Only those aircraft applicable to the selected noise model(s) are displayed: see *Section 10.3, Noise Models*.

- *Engine* - The aircraft engine associated with this flight profile. The available engines will depend on the selected aircraft.

- *Power Units* - The units used to specify engine power settings for this flight profile. The available units will depend on the selected aircraft and engine.

18.5. Runup Information

Some aircraft perform a static runup of their engines before beginning a takeoff roll. The *runup* is the duration of this static runup.

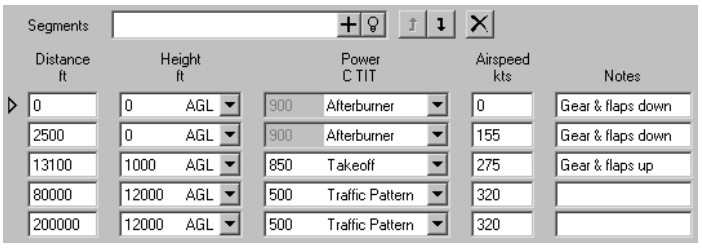
The runup is displayed only for certain aircraft when operating on departure and interfacility flight tracks. For interfacility tracks, the runup is not displayed if the initial airspeed is greater than zero. This allows interfacility tracks to be used in a manner similar to INM's overflight tracks.

You can change the units used to specify times: see *Section 4.9, Setting the Case's Physical Units*.

Note:

The aircraft's power setting when conducting the static runup is specified in the first row of the flight profile segments table.

18.6. Segments



A flight profile's segments are specified using a table, where each table row represents the profile point of a segment. The following table columns are defined. Note that only those columns applicable to the flight profile's aircraft will be displayed.

- *Distance* - The location of this profile point, specified as a linear distance along the flight track, measured from the runway displacement.

  You can change the units used to specify track distances: see *Section 4.9, Setting the Case's Physical Units*.

- *Height* - The aircraft height at this profile point. Type the height, then select whether the height is above ground level (AGL) or above mean sea level (MSL).

You can change the units used to specify heights: see *Section 4.9, Setting the Case's Physical Units*.

- *Power* - The aircraft engine power setting at this profile point. Type the numeric power level, then choose the operation power description (for example, "Takeoff"). For some operation power descriptions (for example, "Afterburner"), the numeric power level is fixed and cannot be changed.

  Power settings are applicable only to NMap and AAM fixed-wing aircraft. The operation power description is applicable only to NMap aircraft.

  The operation power description is used to select which Noisefile interpolation curve to use. Expert users can select the interpolation curve directly by selecting either "Variable" or "Parallel" in place of the operation power description.

  The available operation power descriptions will depend on the flight profile's aircraft and engine. If the aircraft conducts a static runup prior to beginning its takeoff roll, the available operation power descriptions in the first row of the flight profile segments table (where the runup power is set) will be those for static operations.

  Information about the Noisefile record that corresponds to each flyover operation power description is displayed below the segment table.

Description	Notes	Range, C TIT	Interpolation	OPC
Afterburner	No Drag	900	Fixed	1
Approach	Gear and Flaps Down	471.3 to 1090	Variable	5
Intermediate	No Drag	471.3 to 1090	Variable	6
Intermediate (mil)	Mil	471.3 to 1090	Variable	14
Takeoff	No Drag	471.3 to 1090	Variable	3
Traffic Pattern	No Drag	471.3 to 1090	Variable	13

  The *Range* column specifies the range of power levels for which NMap can extrapolate the measured Noisefile noise data. You can enter power settings outside of this range (and are encouraged to do so to accurately record real-world flight parameters). Power levels are clipped to the extrapolation range when NMap is run.

  The *Interpolation* and *OPC* columns specify the Noisefile interpolation method and operational power code, respectively.

- *Aircraft Configuration* - The state of the aircraft's landing gear, flaps, etc. at this profile point. The aircraft configuration is applicable only to fixed-wing AAM aircraft.

- *Airspeed* - The aircraft airspeed at this profile point, in knots. Airspeeds are not applicable to rotary-wing NMap aircraft.

- *Yaw Angle* -
  Angle of Attack -
  Roll Angle -

Thrust Vector Angle -
Nacelle Tilt Angle - The aircraft orientation angles, in degrees. These are applicable only to AAM and RNM aircraft. The angles displayed will vary, depending on the aircraft type (RNM rotary-wing, AAM fixed-wing, etc.).

The sign conventions for the applicable orientation angles are displayed below the profile segments tables.

Note:

The angle of attack and the yaw angle are technically applicable to non-helicopter AAM aircraft. However, for these aircraft, accurate values of these parameters are difficult to obtain, and their values rarely depart significantly from zero. Therefore, by default, zero is assumed for these parameters, and the corresponding columns are hidden in the profile segments table.

If you have specialized needs, you can choose to display and edit these parameters. See *Section 10.9, AAM Advanced Options*, of *Chapter 10, Setting Core Case Properties*, for more information.

- *Left Dispersion Width* -
  Right Dispersion Width - The AAM noise model supports the concept of flight dispersion. This allows you to model aircraft operations that have a lateral Gaussian probability distribution with respect to a flight track.

  To activate flight dispersion, enter non-zero dispersion widths for each flight profile segment. The widths define ±3 standard deviations. Since separate left and right widths are defined, the Gaussian distribution is not necessarily symmetrical with respect to the flight track.

  When specifying dispersion widths, left and right are with respect to the direction the aircraft is flying. That is, they are left (port) and right (starboard) from the pilot's point of view.

  You can change the units used to specify flight dispersion widths: see *Section 4.9, Setting the Case's Physical Units*.

- *Climb Angle* -
  Climb Rate -
  Duration - These non-editable information-only fields are optional. See *Section 10.8, Flight Profile Advanced Options*, of *Chapter 10, Setting Core Case Properties*, for instructions on choosing which of these fields you'd like to display.

Climb Angle indicates the angle of the aircraft's flight path as it flies each segment, measured in degrees from horizontal. The angle is rounded to the closest tenth of a degree. Negative angles indicate that the aircraft is descending.

Climb Rate indicates the rate at which the aircraft is gaining or losing altitude while flying each segment, measure in feet per minute (fpm). The rate is rounded to the closest 100 fpm. A negative climb rate indicates that the aircraft is descending, while a rate of zero indicates level flight.

Duration indicates the time it takes the aircraft to fly each segment, rounded to the nearest second. It is calculated based upon the average speed over an entire segment (i.e., the average of the airspeeds at the beginning and end of the segment). For the purpose of this calculation, ground speed is assumed to be equal to airspeed.

- *Notes* - Miscellaneous information about this profile segment. There is no restriction on the text that can be typed into this box. The notes are not used by the noise models; they are for your use to record any information you believe is relevant.

The triangle icon indicates the selected flight profile segment. To select another segment, either click somewhere on that segment's row, or navigate to that segment using the Tab key.

To add a new segment, either press the Add Segment button, or press Ctrl + A. The new segment will be added directly below the selected segment. Alternatively, using the Add mouse tool, click on the location along the flight track where the new profile point should be added. See *Section 6.4, The Add Mouse Tool*, for more information.

To delete the selected segment, either press the Delete Segment button, or press Ctrl + Del.

To move the selected segment up or down in the table, press the Move Up and Move Down buttons and, or press Ctrl + U and Ctrl + D.

When you add a new segment, BaseOps simply duplicates the selected segment. If desired, you can use the quick-add feature, which lets you efficiently add a segment while simultaneously specifying its properties. To add a segment, type a quick-add command into the text box, then press the Add Segment button or the Enter key.

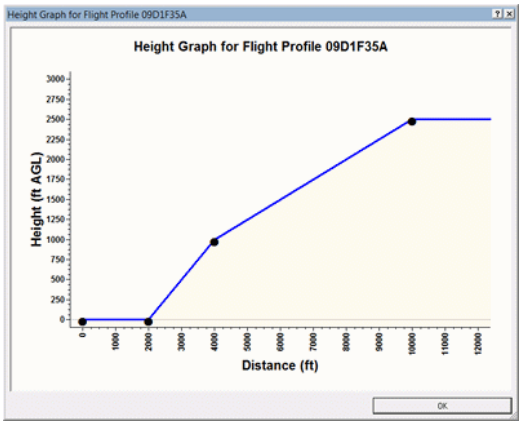
The quick-add commands are somewhat cryptic, but once learned, they allow you to add segments very quickly. Frequent users will find it worthwhile spending a few minutes learning the quick-add commands. To display a list of the quick-add commands that you can use, either press the Quick-Add Hints button, or press Ctrl + H.

Tip:

Using the Select and Edit map tool, you can graphically edit a flight profile's segments. See *Section 6.3, The Select and Edit Mouse Tool*, for more information.

Tip:

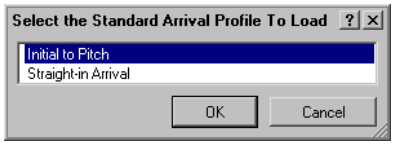
Press the Show Profile Height Graph button to view a graphical representation of the profile's height as a function of track distance.



18.7. The Standard Profile Library

BaseOps ships with a library of standard flight profiles for many aircraft. These default profiles are useful if you are unable to obtain the actual flight profile flown by an aircraft at the site you are modeling.

To load a standard profile from the library, press the Load Standard Profile button. A dialog box appears, listing the available standard profiles that apply to your profile's aircraft, engine, and flight track type.



Select the desired profile, then press OK. The following properties in your flight profile will be updated to match the library profile.

- Power Units
- Runway Displacement(s)
- Runup Duration
- Profile Segments

If desired, you can save your own flight profiles to the standard profile library. To save the current profile, press the Save as Standard Profile button. A dialog box appears, asking for the name that this profile will be known by in the library.

Tip:

Your user library of standard flight profiles is stored in the file `Standard Flight Profile Library - User.baseops`, which is located in the BaseOps home directory. This is a regular BaseOps case file. If desired, you can load this case into BaseOps and edit it. If you choose to do so, note these points.

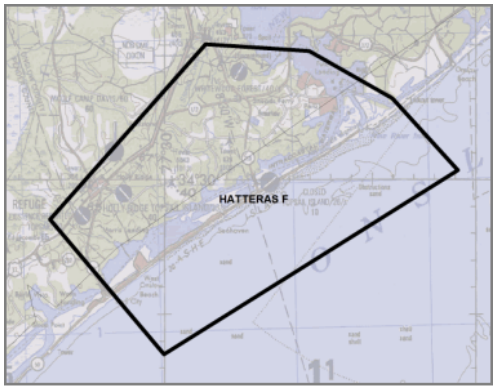
- Make sure each profile's Long Name contains a description of the profile (even if the description is simply something generic like "Standard Departure" or "Standard Arrival"). The long name is the text that is displayed to the user when displaying a list of standard profiles to choose from.
- Make sure that the profile's flight track is set to either Arrival or Departure, depending on whether the profile is for arrivals or departures.
- The height of all flight profile segments should be specified using AGL, not MSL.

The BaseOps library (as opposed to the user library) of standard flight profiles is stored in the file `Standard Flight Profile Library - BaseOps.baseops`. Only BaseOps' developers should edit this file, as it will be overwritten whenever a new version of BaseOps is installed.

Chapter 19

Editing Military Operations Areas

A military operations area (MOA) is a region of airspace where aircraft engage in dispersed operations. Vertically, MOAs are defined by floor and ceiling altitudes. Horizontally, they are defined by a polygon consisting of three or more geographic points.



An example military operating area, named Hatteras F, defined by 6 vertex points.

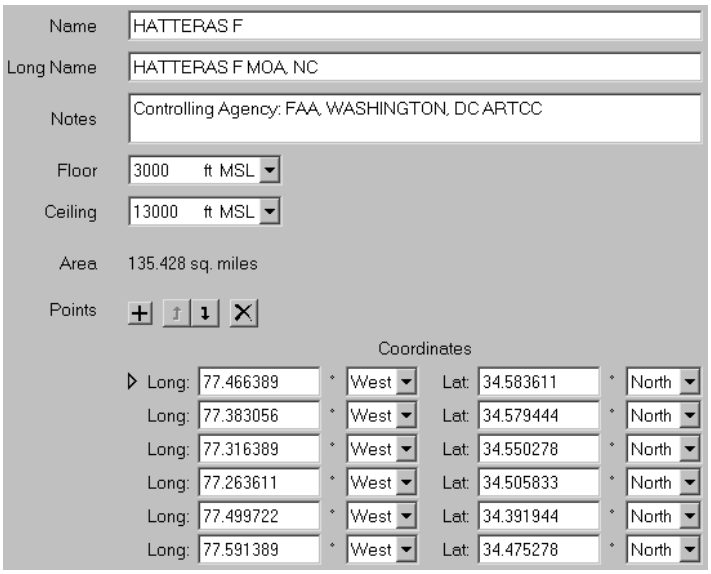
MOAs are used by the MRNMap noise model. Unless that model is selected, the parts of the BaseOps user interface dealing with MOAs will be hidden. See *Section 10.3, Noise Models*.

To work with MOAs, choose Military Operations Areas from the object type selector dropdown list. MOAs can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

Tip:

BaseOps can import MOAs from DAFIF. See *Chapter 26, Importing Information from DAFIF*.

To edit a MOA, first select it in the object list, then edit its properties in the text pane.



MOAs have the following properties.

- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the MOA.

- *Long Name* - A one-line (80 characters maximum) name for the MOA. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.

- *Notes* - Miscellaneous information about the MOA. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

- *Floor* -
  Ceiling - The minimum and maximum flight levels for this MOA. Type the height, then select whether the height is above ground level (AGL) or above mean sea level (MSL).

  You can change the units used to specify heights: see *Section 4.9, Setting the Case's Physical Units*.

- *Area* - The area within the MOA's boundary. The area is automatically updated as you edit the MOA.

  You can change the units used to specify the area: see *Section 4.9, Setting the Case's Physical Units*.

- *Points* - The geographic coordinates of the vertex points of the polygon that defines the MOA's horizontal boundary. The points are presented in a table.

A minimum of three points must be defined. The polygon must have non-zero area, and the sides must not cross each other. The polygon's vertex points can be defined in either the clockwise or the counterclockwise direction.

You can change the coordinate system used to specify the points: see *Section 4.8, Setting the Case Coordinate System.*

The triangle icon indicates the selected point. To select another point, either click somewhere on that point's row, or navigate to that point using the Tab key. Alternatively, click on that point on the map using the Select and Edit mouse tool.

To add a new point, either press the Add New Point button, or press Ctrl + A. Alternatively, use the Add mouse tool to add new points by clicking on the map. New points are added to the polygon boundary after the selected point.

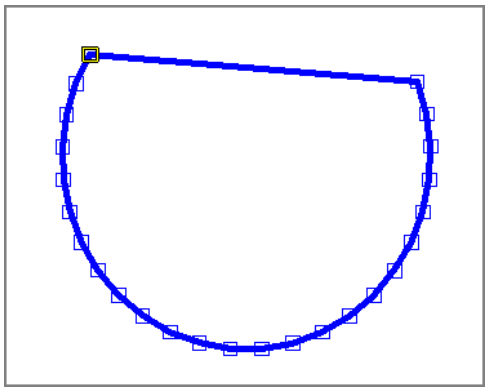
Tip:

When editing MOAs on the map, you will often find yourself switching back and forth between using the Select and Edit and the Add mouse tools. As a convenience in such situations, hold down the Ctrl key to make the Add mouse tool temporarily act like the Select and Edit mouse tool, and vice versa.

To delete the selected point, either press the Delete Point button, or press Ctrl + Del.

To move the selected point up or down in the table, press the Move Up and Move Down buttons and, or press Ctrl + U and Ctrl + D.

When you are editing a MOA, BaseOps marks the vertex points on the map. This makes it easier to edit the MOA using the mouse tools.



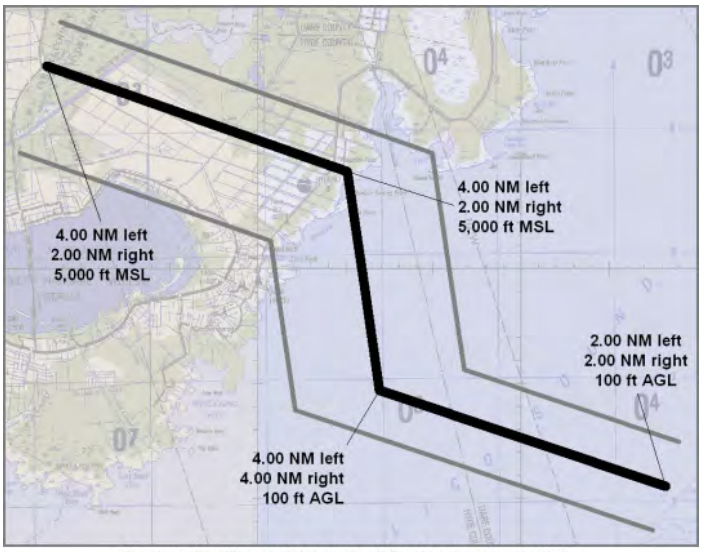
The upper-left point, highlighted in yellow, is the selected point.

Chapter 20

Editing Military Training Routes

A military training route (MTR) is a long, relatively narrow volume of airspace that aircraft operate in when traveling between two locations. Horizontally, an MTR is defined by a series of line segments denoting the centerline of the MTR, along with a width that can vary with location along the MTR centerline. Vertically, an MTR is defined by a floor height.

In BaseOps, an MTR is defined by 2 or more *segment points*. Each adjacent pair of segment points defines one straight segment of the MTR.



An example military training route, defined by 4 segment points.

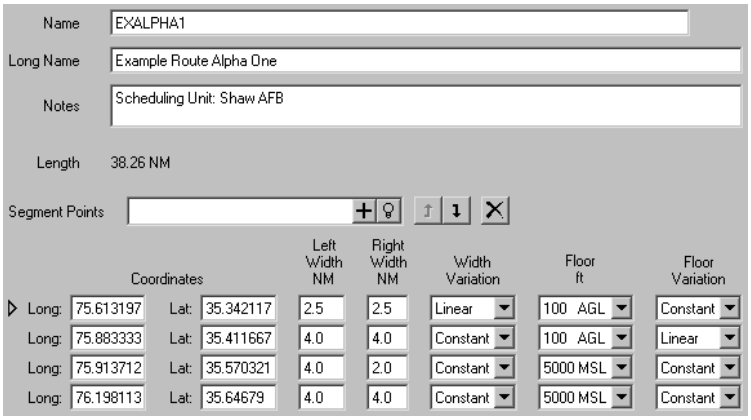
MTRs are used by the MRNMap noise model. Unless that model is selected, the parts of the BaseOps user interface dealing with MTRs will be hidden. See *Section 10.3, Noise Models*.

To work with MTRs, choose Military Training Routes from the object type selector dropdown list. MTRs can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

Tip:

BaseOps can import MTRs from DAFIF. See *Chapter 26, Importing Information from DAFIF*.

To edit an MTR, first select it in the object list, then edit its properties in the text pane.



MTRs have the following properties.

- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the MTR.
- *Long Name* - A one-line (80 characters maximum) name for the MTR. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.
- *Notes* - Miscellaneous information about the MTR. There is no restriction on the length of notes. Press the Enter key to insert additional lines.
- *Length* - The length of the MTR's centerline. The length is automatically updated as you edit the MTR.

  You can change the units used to specify the length: see *Section 4.9, Setting the Case's Physical Units*.
- *Segment Points* - An MTR's segments are specified using a table, where each table row represents a segment point. An MTR must consist of at least one segment, so a minimum of two segment points must be supplied.

  The following table columns are defined.

  - *Coordinates* - The geographic location of this segment point.

Zero-length segments are not allowed: i.e., adjacent segment points in the table must not have the same coordinates.

You can change the coordinate system used to specify locations: see *Section 4.8, Setting the Case Coordinate System*.

- *Turn Radius* - The radius of the turn to the next segment point. It is not unusual for MTR turn radiuses to be zero, and for an MTR to contain a mixture of both zero-radius and non-zero-radius turns.

  The turn begins at the location specified in the Coordinates column. The angle of the turn is automatically calculated based upon the coordinates of the next segment point.

  You can change the units used to specify MTR turn radiuses: see *Section 4.9, Setting the Case's Physical Units*.

- *Left Width*
  Right Width - The width of the MTR to the left and right of the MTR's centerline. Left and right are interpreted from the perspective of the pilot of an aircraft that is flying along the MTR from beginning to end. Zero widths are allowed.

  You can change the units used to specify MTR widths: see *Section 4.9, Setting the Case's Physical Units*.

  Important:

  The current version of MRNMap does not support segments that have different left and right widths. It is expected that in the future, a version of MRNMap without this limitation will become available.

- *Width Variation* - How the MTR width varies along the segment. If the variation is *constant*, then the width is constant along the entire segment. If the variation is *linear*, then the width varies linearly with distance along the segment centerline; at the end of the segment, the width is equal to the width specified by the next segment point.

  The width variation is ignored in the last row of the table.

  Important:

  The current version of MRNMap ignores the width variation settings in the MRNMap input file, and treats all segments as if their width variation is constant. It is expected that in the future, a version of MRNMap without this limitation will become available.

- *Floor*
  Turn Exit Floor - The floor is the minimum allowed flight level for an MTR segment. Type the height, then select whether the height is above ground level (AGL) or above mean sea level (MSL).

  For turns with non-zero radius, the floor descends to the turn exit floor linearly through the turn. The turn exit floor is then used for the remainder of this segment, up until the next segment point.

  For turns with zero radius, the turn exit floor is not applicable.

  You can change the units used to specify heights: see *Section 4.9, Setting the Case's Physical Units*.

- *Notes* - Miscellaneous information about this MTR segment. There is no restriction on the text that can be typed into this box. The notes are not used by the noise models; they are for your use to record any information you believe is relevant.

In the segment points table, the triangle icon indicates the selected segment point. To select another point, either click somewhere on that point's row, or navigate to that point using the Tab key. Alternatively, click on that point on the map using the Select and Edit mouse tool.

To add a new segment point, either press the Add New Point button, or press Ctrl + A. Alternatively, use the Add mouse tool to add new points by clicking on the map. New points are added to the MTR after the selected point.

Tip:

When editing MTRs on the map, you will often find yourself switching back and forth between using the Select and Edit and the Add mouse tools. As a convenience in such situations, hold down the Ctrl key to make the Add mouse tool temporarily act like the Select and Edit mouse tool, and vice versa.

When you add a new segment point, BaseOps duplicates the selected point. If desired, you can use the quick-add feature, which lets you efficiently add a segment point while simultaneously specifying its properties. To add a point, type a quick-add command into the text box, then press the Add New Point button or the Enter key.

The quick-add commands are somewhat cryptic, but once learned, they allow you to add segment points very quickly. Frequent users will find it worthwhile spending a few minutes learning the quick-add commands. To display a list of the quick-add commands that you can use, either press the Quick-Add Hints button, or press Ctrl + H.

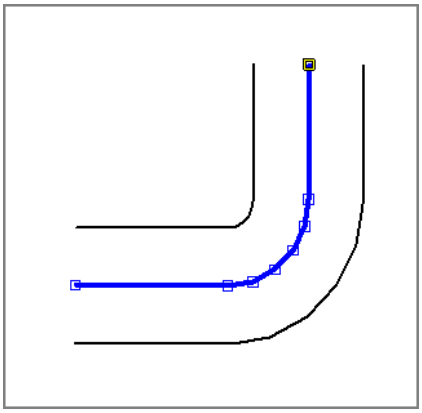
To delete the selected segment point, either press the Delete Point button ✕, or press Ctrl + Del.

To move the selected point up or down in the table, press the Move Up and Move Down buttons ↑ and ↓, or press Ctrl + U and Ctrl + D.

Tip:

Using the Select and Edit map tool, you can graphically edit a MTR's segments. See *Section 6.3, The Select and Edit Mouse Tool*, for more information.

When you are editing an MTR, BaseOps marks the segment points on the map. This makes it easier to edit the MTR using the mouse tools.



The upper-right segment point, highlighted in yellow, is the selected point.

Chapter 21

Editing Airspace Profiles

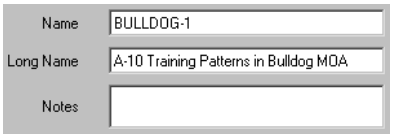
An *airspace profile* describes the operational characteristics (engine power setting, altitude profile, frequency of operations, etc.) of an aircraft operating in a either a military operations area (MOA) or a military training route (MTR).

Airspace profiles are used by the MRNMap noise model. Unless that model is selected, the parts of the BaseOps user interface dealing with airspace profiles will be hidden. See *Section 10.3, Noise Models*.

To work with airspace profiles, choose Airspace Profiles from the object type selector dropdown list. Airspace profiles can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit a airspace profile, first select it in the object list, then edit it in the text pane. Airspace profiles have numerous properties. These are listed below, grouped for easy reference.

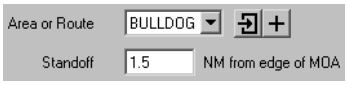
21.1. Profile Name and Notes



- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the airspace profile.
- *Long Name* - A one-line (80 characters maximum) name for the airspace profile. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.

- *Notes* - Miscellaneous information about the airspace profile. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

21.2. Area or Route Information



- *Area or Route* - The MOA or MTR associated with the airspace profile. This defines the geographic region where the aircraft operates.

  Select the MOA or MTR from the dropdown list. Press the Add button + to add a new MOA or MTR. Press the Go To button to edit the selected MOA or MTR.

  See *Chapter 19, Editing Military Operations Areas*, and *Chapter 20, Editing Military Training Routes*, for more information.

- *Standoff* - The distance from the boundary of a MOA where an aircraft begins to turn while operating in that MOA. In the turning zone, the frequency of aircraft operations linearly decreases, reaching zero at the MOA's boundary.

  The standoff distance is only applicable to MOAs, and is hidden when an MTR is selected.

  You can change the units used to specify the standoff distance: see *Section 4.9, Setting the Case's Physical Units*.

21.3. Operation Counts

- *Annual Ops* - The average number of times per year that the airspace profile is flown during the day, evening, and night. Note that day, evening, and night are precisely defined periods: see *Section 10.5, Operations*. The evening period will be displayed only if the number of daily periods for this BaseOps case is three.

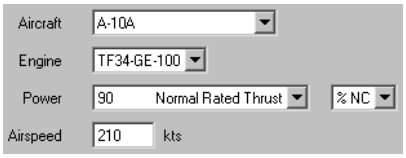
  The number of monthly operations is calculated by dividing the annual operations by 12. The number of daily operations is calculated by dividing the monthly operations by the average flying days per month: see *Section 10.5, Operations*.

- *Air Time* - The length of time that the aircraft operates in a MOA as part of a single operation. The MOA's average daily usage time for the airspace profile is calculated by multiplying the air time by the number of daily operations.

  Air time is only applicable to MOAs, and is hidden when an MTR is selected.

  You can change the units used to specify air times: see *Section 4.9, Setting the Case's Physical Units*.

21.4. Aircraft Information



- *Aircraft* - The aircraft associated with this airspace profile.

- *Engine* - The aircraft engine associated with this airspace profile. The available engines will depend on the selected aircraft.

- *Power* - The aircraft engine power setting used by the aircraft when operating as part of this airspace profile. Type the numeric power level, choose the operation power description (for example, "Normal Rated Thrust"), and choose the units used to specify the power level (for example, "% NC"). Note that for some operation power descriptions (for example, "Afterburner"), the numeric power level is fixed and cannot be changed.

  The operation power description is used to select which Noisefile interpolation curve to use. Expert users can select the interpolation curve directly by selecting either "Variable" or "Parallel" in place of the operation power description.

  The available operation power descriptions will depend on the airspace profile's aircraft and engine. As an aid to the user, information about the Noisefile record that corresponds to each operation power description is displayed.

Description	Notes	Range, % NC	Interpolation	OPC
Approach	Gear and Flaps Down	83.8 to 103	Variable	5
Max Rated Thrust	No Drag	83.8 to 103	Variable	11
Normal Rated Thrust	No Drag	83.8 to 103	Variable	12
Traffic Pattern	No Drag	83.8 to 103	Variable	13

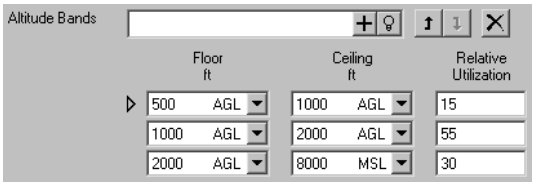
  The *Range* column specifies the range of power levels for which MRNMap can extrapolate the measured Noisefile noise data. You can enter power settings outside of this range (and are encouraged to do so to accurately record real-world flight parameters). Power levels are clipped to the extrapolation range when MRNMap is run.

The *Interpolation* and *OPC* columns specify the Noisefile interpolation method and operational power code, respectively.

Airspeed - The aircraft's airspeed when operating as part of this airspace profile.

21.5. Altitude Bands

Each airspace profile has a distribution of heights at which the aircraft operates as part of that profile. The distribution is defined by a set of one or more altitude bands (delimited by floor and ceiling heights), along with the relative amount of time spent in each band.



The altitude bands are specified using a table, where each table row represents one band. The following table columns are defined.

- *Floor* -
  Ceiling - The minimum and maximum flight levels of this altitude band. Type the height, then select whether the height is above ground level (AGL) or above mean sea level (MSL).

  At least one band must be specified, and each band's ceiling must be at least as high as its floor. Otherwise, no restrictions are placed on the band heights. Bands with a zero height range are allowed: i.e., the floor can equal the ceiling. Bands can be listed in any order, and the height range of different bands can overlap. Uses as many bands as needed to model the distribution of heights at which the aircraft flies.

  You can change the units used to specify heights: see *Section 4.9, Setting the Case's Physical Units*.

- *Relative Utilization* - The relative amount of time the aircraft spends in this altitude band. The utilization numbers are unitless. MRNMap compares the utilization numbers for each band to determine the relative amount of time the aircraft spends in each band.

  For example, assume you have two altitude bands, with relative utilization numbers of 10 and 30, respectively. In this case, MRNMap would model the aircraft flying 25% of the time in the first band and 75% of the time in the second.

The triangle icon ▷ indicates the selected altitude band. To select another band, either click somewhere on that band's row, or navigate to that band using the Tab key.

To add a new band, either press the Add Altitude Band button +, or press Ctrl + A. The new band will be added directly below the selected one.

To delete the selected band, either press the Delete Altitude Band button ×, or press Ctrl + Del.

To move the selected band up or down in the table, press the Move Up and Move Down buttons ↑ and ↓, or press Ctrl + U and Ctrl + D. This capability is provided solely for your own organizational purposes; MRNMap attributes no meaning to the order in which bands are listed.

When you add a new altitude band, BaseOps simply duplicates the selected one. If desired, you can use the quick-add feature, which lets you efficiently add an altitude band while simultaneously specifying its properties. To add a band, type a quick-add command into the text box, then press the Add Altitude Band button + or the Enter key.

The quick-add commands are somewhat cryptic, but once learned, they allow you to add bands very quickly. Frequent users will find it worthwhile spending a few minutes learning the quick-add commands. To display a list of the quick-add commands that you can use, either press the Quick-Add Hints button ?, or press Ctrl + H.

Chapter 22

Editing Attack Runs

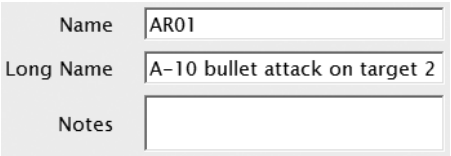
An *attack run* describes the operational characteristics of an aircraft engaging in airborne gunnery operations directed against a ground target.

Attack runs are used by the AGM noise model. Unless that model is selected, the parts of the BaseOps user interface dealing with attack runs will be hidden. See *Section 10.3, Noise Models*.

To work with attack runs, choose Attack Runs from the object type selector dropdown list. Attack runs can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

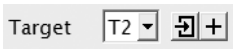
To edit an attack run, first select it in the object list, then edit it in the text pane. Attack runs have numerous properties. These are listed below, grouped for easy reference.

22.1. Attack Run Name and Notes



- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the attack run.
- *Long Name* - A one-line (80 characters maximum) name for the attack run. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.
- *Notes* - Miscellaneous information about the attack run. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

22.2. Target Information

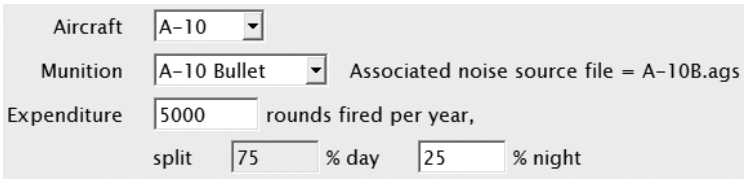


Target - The target associated with the attack run. This defines the point at which airborne gunnery fire is directed.

Select the target from the dropdown list. Press the Add button + to add a new target. Press the Go To button to edit the selected target.

See *Chapter 13, Editing Point Objects*, for more information on defining and editing targets.

22.3. Aircraft and Munition Information



- *Aircraft* - The aircraft being used for this attack run.
- *Munition* - The munition being fired at the target.The available munitions will depend on the selected aircraft.

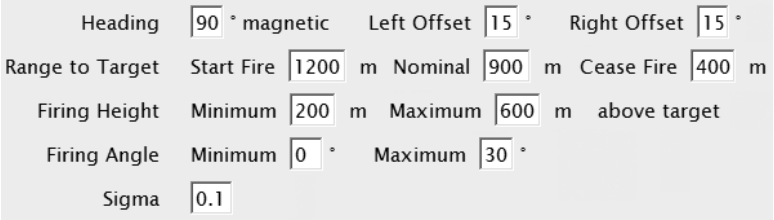
  Once the munition has been selected, the name of the associated AGM noise source file will be shown. Source files contain the measured or estimated spectral noise data for a munition. The files are located in the `AGM\Sources` directory.

- *Expenditure* - The annual number of munition rounds fired. The number of daily rounds fired is calculated by dividing the annual expenditure by 365.
- *Split* - The percentage split of rounds fired during the day, evening, and night periods. Specify the percentages for the evening and night periods. The day period percentage will then be calculated so that the values sum to 100%.

  Note that day, evening, and night are precisely defined periods: see *Section 10.5, Operations*. The evening split will be displayed only if the number of daily periods is set to three for this BaseOps case.

22.4. Firing Volume Information

The firing volume is a 3-dimensional shape associated with an attack run that encloses all locations where the weapon might potentially be fired at the target. The firing volume is defined by the following properties.



- *Heading* - The attack vector: i.e., the magnetic heading of the nominal center vector of the firing volume.

- *Left Offset*
  Right Offset - The vectors defining the left and right sides of the firing volume, specified as angular offsets from the attack vector.

- *Nominal Range to Target* - The nominal center point of the firing volume, measured horizontally from the target.

- *Start Fire Range to Target*
  Cease Fire Range to Target - The horizontal distances from the target at which the aircraft starts and stops firing its weapon. These distances define arcs, centered on the target, that form the front and back sides of the firing volume.

- *Minimum Firing Height*
  Maximum Firing Height - The minimum and maximum heights of the firing volume, measured with respect to the target.

- *Minimum Firing Angle*
  Maximum Firing Angle - Bounds on the munition firing angle, measured as angular depressions from horizontal. A firing angle of zero would be towards the horizon, while an angle of 90 would be straight down. The firing angle bounds act as additional constraints on the firing volume.

- *Sigma* - The sigma parameter controls the probabilistic distribution of munition firing points within the firing volume. A sigma of 10 would result in the firing points being clustered near the nominal center of the firing volume. A sigma of 0.01 would result in the firing points being (almost) equally distributed throughout the volume.

Chapter 23

Editing Static Profiles

A *static profile* describes the noise created by an aircraft when its engine(s) are run on the ground during maintenance and repair work. Operating an aircraft in this manner is sometimes known as a *static runup*.

In BaseOps, static profiles are defined by a sequence of one or more *static profile segments*. Each segment describes the duration that the engine(s) are run at a particular power setting.

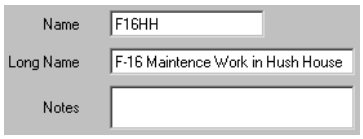
Static profiles are used by the NMap and AAM noise models. Unless one of those models is selected, the parts of the BaseOps user interface dealing with static profiles will be hidden. See *Section 10.3, Noise Models*.

To work with static profiles, choose Static Profiles from the object type selector dropdown list. Static profiles can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit a static profile, first select it in the object list, then edit its properties in the text pane.

Static tracks have numerous properties. These are listed below, grouped for easy reference.

23.1. Profile Name and Notes



- *Name* - A short (10 characters maximum) name that uniquely and unambiguously identifies the static profile.

- *Long Name* - A one-line (80 characters maximum) name for the static profile. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.

- *Notes* - Miscellaneous information about the static profile. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

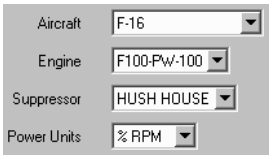
23.2. Static Pad Information

- *Pad* - The static pad associated with this static profile. The pad determines the location of the aircraft modeled by this static profile.

  Select the pad from the dropdown list. Press the Add Static Pad button + to add a new pad. Press the Go To Static Pad button to edit the selected pad. See *Chapter 13, Editing Point Objects*, for more information.

- *Heading* - The heading of the aircraft modeled by this static pad, in degrees east of magnetic north. If an aircraft performs static runups while pointed in two or more directions, separate static profiles must be created for each direction.

23.3. Aircraft Information



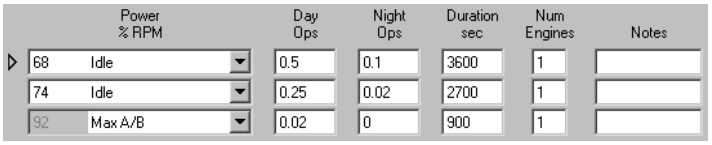
- *Aircraft* - The aircraft associated with this static profile. Only those aircraft applicable to the selected noise model(s) are displayed: see *Section 10.3, Noise Models*.

- *Engine* - The aircraft engine associated with this static profile. The available engines will depend on the selected aircraft and noise model.

- *Suppressor* - The noise suppressor associated with this static profile. The available noise suppressors will depend on the selected aircraft, engine, and noise model.

- *Power Units* - The units used to specify engine power settings for this static profile. The available units will depend on the selected aircraft, engine, noise suppressor, and noise model.

23.4. Segments



A static profile's segments are specified using a table, where each table row models the running of one or more aircraft engines for a specific power setting and duration. The following table columns are defined.

- *Power* - The aircraft engine power setting for this segment. Type the numeric power level, then choose the operation power description (for example, "Idle"). For some operation power descriptions (for example, "Max A/B"), the numeric power level is fixed and cannot be changed.

  Power settings are applicable only to NMap and AAM fixed-wing aircraft. The operation power description is applicable only to NMap aircraft.

  The operation power description is used to select which Noisefile interpolation curve to use. The available operation power descriptions will depend on the static profile's aircraft, engine, and noise suppressor. Information about the Noisefile record that corresponds to each operation power description is displayed below the segment table.

Description	Range, % RPM	Interpolation	OPC
80% RPM Eng Runup	80	Variable	19
Idle	68	Variable	13
Max A/B	92	Fixed	3
Mil	92	Variable	4

  The *Range* column specifies the range of power levels for which NMap can extrapolate the measured Noisefile noise data. You can enter power settings outside of this range (and are encouraged to do so to accurately record real-world runup parameters). Power levels are clipped to the extrapolation range when NMap is run.

  The *Interpolation* and *OPC* columns specify the Noisefile interpolation method and operational power code, respectively.

- *Aircraft Configuration* - The state of the aircraft's landing gear and flaps. The aircraft configuration is applicable only to fixed-wing AAM aircraft. For static profiles, you will usually use the "static runup" configuration.

- *Speed* - The notional speed of the aircraft, used as a proxy for the engine power setting for AAM rotary-wing aircraft.

- *Thrust Vector Angle* -
  Nacelle Tilt Angle - The aircraft configuration angles, in degrees. These are applicable only to AAM aircraft. The angles displayed will vary, depending on the aircraft type.

  The sign conventions for the applicable configuration angles are displayed below the profile segments tables.

- *Day Ops* -
  Evening Ops -
  Night Ops - The average number of times per calendar day that the static profile is performed during the day, evening, and night. Note that day, evening, and night are precisely defined periods: see *Section 10.5, Operations*. The evening period will be displayed only if the number of daily periods for this BaseOps case is three.

- *Duration* - The length of time that the engines are operated when this static profile segment is performed.

  You can change the units used to specify times: see *Section 4.9, Setting the Case's Physical Units*.

- *Num Engines* - The number of engines that are simultaneously operated when this static profile segment is performed.

- *Notes* - Miscellaneous information about this profile segment.

The triangle icon ▷ indicates the selected static profile segment. To select another segment, either click somewhere on that segment's row, or navigate to that segment using the Tab key.

To add a new segment, either press the Add Segment button +, or press Ctrl + A. The new segment will be added directly below the selected segment.

To delete the selected segment, either press the Delete Segment button ✕, or press Ctrl + Del.

To move the selected segment up or down in the table, press the Move Up and Move Down buttons ↑ and ↓, or press Ctrl + U and Ctrl + D. This capability is provided solely for your own organizational purposes; NMap attributes no meaning to the order in which segments are listed.

When you add a new segment, BaseOps simply duplicates the selected segment. If desired, you can use the quick-add feature, which lets you efficiently add a segment while simultaneously specifying its properties. To add a segment, type a quick-add command into the text box, then press the Add Segment button + or the Enter key.

The quick-add commands are somewhat cryptic, but once learned, they allow you to add segments very quickly. Frequent users will find it worthwhile spending a few minutes learning the quick-add commands. To display a list of the quick-add commands that you can use, either press the Quick-Add Hints button , or press Ctrl + H.

Chapter 24

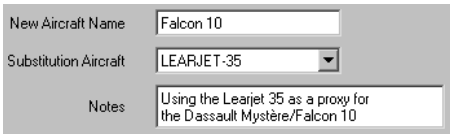
Defining Aircraft Substitutions

When creating a BaseOps case, you may need aircraft that are not present in the standard aircraft library. To handle this situation, BaseOps allows you to define *aircraft substitutions*, which associate new aircraft names with equivalent proxy aircraft that are in the library.

Once the substitutions are defined, the new aircraft can be used throughout the BaseOps case. However, when the noise models are run, the substitution aircraft are used.

To define aircraft substitutions, choose Aircraft Substitutions from the object type selector dropdown list. Substitutions can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit an aircraft substitution, first select it in the object list, then edit its properties in the text pane.



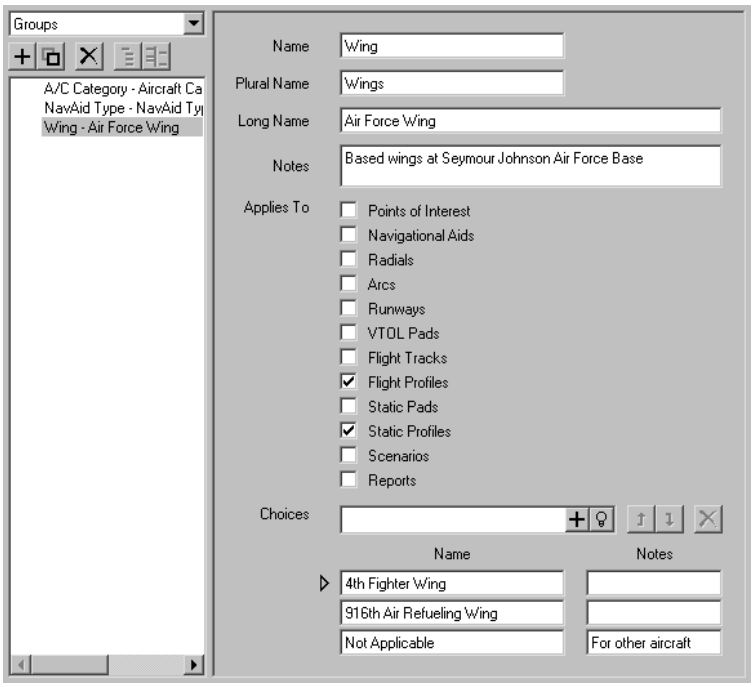
Aircraft substitutions have the following properties.

- *New Aircraft Name* - The name of the new, non-BaseOps aircraft you are defining. While there is no limit on the name's length, you should keep it as short as possible.
- *Substitution Aircraft* - The name of the standard library aircraft that will act as a substitute for the new aircraft.
- *Notes* - Miscellaneous information about the aircraft substitution. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

Chapter 25

Using Groups

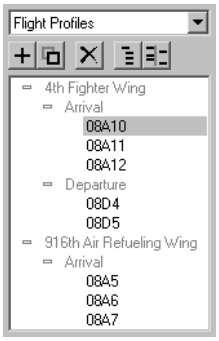
BaseOps allows you to define arbitrary *groups* that can be used to classify objects such as flight tracks and flight profiles. For example, you can make a group called "Wing", give it possible values such as "4th Fighter Wing" and "916th Air Refueling Wing", and make it applicable to flight and static profiles.



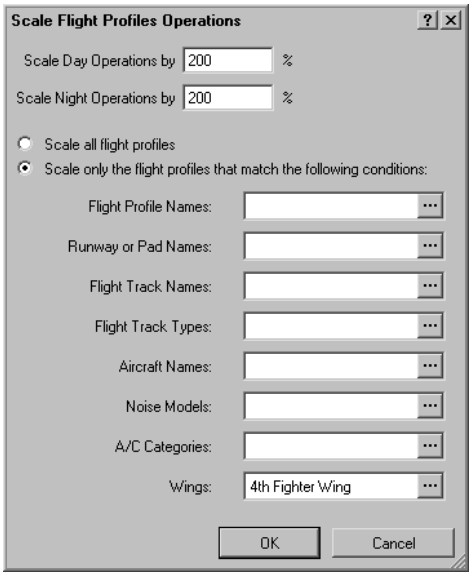
When editing flight profiles, you would see a dropdown control labeled "Wing". You could specify that this profile represents a 4th Fighter Wing operation, while that profile represents a 916th Air Refueling Wing operation.

You could then use the Wing group for a variety of purposes, such as...

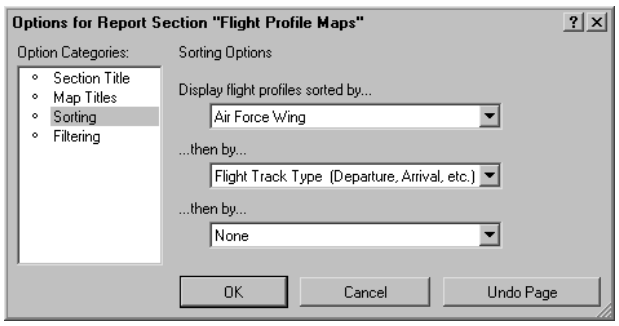
- sorting and grouping the object list. See *Chapter 5, Working with the List Pane*.



- defining scenarios. For example, you could double the number of 4th Fighter Wing flight operations. See *Chapter 31, Using Scenarios*.



- organizing reports. For example, you could print flight profile maps grouped by the fighter wing. See *Chapter 34, Creating Reports*.



To work with groups, choose Groups from the object type selector dropdown list. Groups can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit a group, first select it in the object list, then edit its properties in the text pane. Groups have the following properties.

- *Name* - A short (15 characters maximum) name that uniquely and unambiguously identifies the group.

- *Plural Name* - The plural version of *Name*. This can be left blank if the plural is formed by simply adding an 's' to the end of *Name*.

- *Long Name* - A one-line (80 characters maximum) name for the group. The long name can be more descriptive than the short name. It is optional: if you do not supply a long name, the short name will be used in its place when necessary.

- *Notes* - Miscellaneous information about the group. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

- *Applies To* - The type(s) of object(s) that this group is applicable to. Check the boxes next to all applicable object types.

- *Choices* - The possible values that this group can have. List the names of the choices, and if desired, type notes associated with each choice.

  To add a new choice, type the name of the choice into the text box, then either press the Add Choice button +, or press Ctrl + A.

  To delete a choice, either press the Delete Choice button ×, or press Ctrl + Del.

To move a choice up or down in the table, press the Move Up and Move Down buttons and , or press Ctrl + U and Ctrl + D. The first choice listed will be the default value for this group.

Tip:

It will often be useful to create a choice named "Not Applicable", "Other", or some similar catch-all phrase.

Every BaseOps case includes two predefined groups.

1. **A/C Category** - This group defines the different aircraft categories, such as Based and Transient.

2. **NavAid Type** - This group defines the different navigational aid types, such as VOR and TACAN.

You should not delete the predefined groups or remove any of the predefined choices. However, if you wish, you can add additional choices.

Chapter 26

Importing Information from DAFIF

The United States' National Imagery and Mapping Agency (NIMA) regularly publishes an extensive database of aeronautical information. This database is known as the Digital Aeronautical Flight Information File (DAFIF).

BaseOps can import the following information from DAFIF.

- Airfield Information
- Navigational Aids
- Waypoints
- Runways
- Military Operations Areas (MOAs)
- Military Training Routes (MTRs)
- Vertical Takeoff and Landing (VTOL) Pads

26.1. Obtaining DAFIF

Beginning October 1, 2006, DAFIF was no longer accessible to the public. Access to DAFIF was restricted to US military and DoD customers, US federal, state and local government customers, and foreign government bilateral exchange agreement partners. See http://164.214.2.62/products/usfif/index.cfm for more information. Note that contractors working for an approved agency should be able to obtain DAFIF through that agency.

Important:

Different editions of DAFIF are available. BaseOps is designed to import from DAFIF Edition 7. BaseOps will attempt to import data from other editions, but it may not be successful. If an error occurs, obtain a DAFIF dataset of the correct edition.

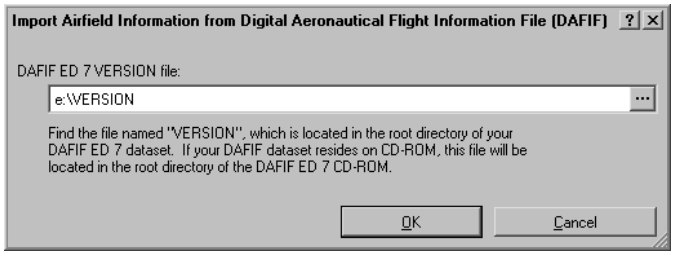
26.2. Importing Airfield Information

BaseOps can import the following airfield information from DAFIF.

- Airfield name
- Notes about the airfield (FAA ID, ICAO ID)
- Site reference point
- Magnetic declination

To import airfield information, follow these steps.

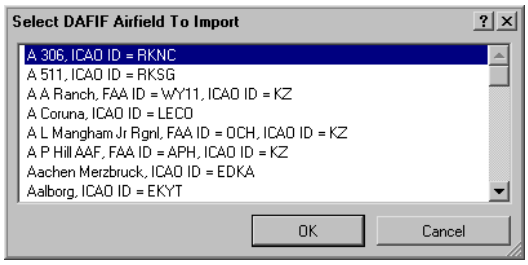
1. Choose Import From DAFIF from the File menu, then choose Airfield Information. The Import Airfield Information dialog box appears.



2. *DAFIF ED 7 VERSION file* - Type the full path name of the DAFIF ED 7 VERSION file. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

   This file is named `VERSION`. You will find it in the root directory of your DAFIF dataset. If your dataset resides on CD-ROM, this file will be located in the root directory of the DAFIF ED 7 CD-ROM.

3. Press OK. The Select DAFIF Airfield to Import dialog box appears.



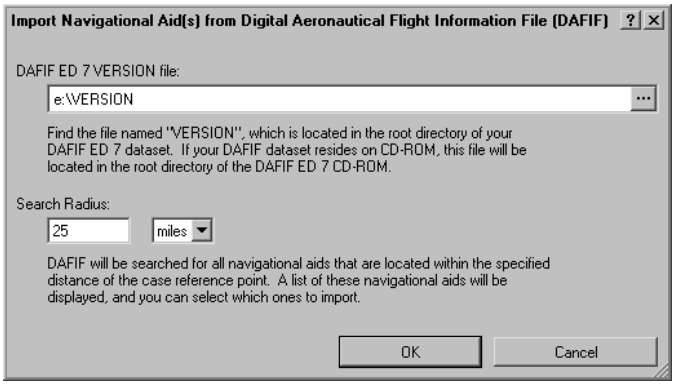
4. Select the airfield to import, then press OK. The appropriate data in the current BaseOps case is updated.

26.3. Importing Other Types of Objects

BaseOps can import navigational aids, waypoints, runways, military operations areas, military training routes, and VTOL pads from DAFIF. The processes for importing all of these items are very similar. Therefore, only navigational aids will be discussed. Keep in mind, however, that the following instructions also apply to the other types of objects.

To import one or more navigational aids from DAFIF, follow these steps.

1. Choose Import From DAFIF from the File menu, then choose Navigational Aid(s). The Import Navigational Aid(s) dialog box appears.

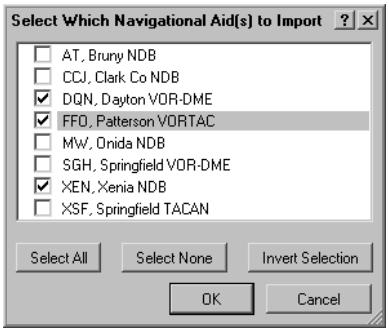


2. *DAFIF ED 7 VERSION file* - Type the full path name of the DAFIF ED 7 VERSION file. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

   This file is named `VERSION`. You will find it in the root directory of your DAFIF dataset. If your dataset resides on CD-ROM, this file will be located in the root directory of the DAFIF ED 7 CD-ROM.

3. *Search Radius* - DAFIF includes a large number of navigational aids (over 11,000). The search radius allows you to search DAFIF for those navigational aids that are relatively close to your area of interest (i.e., close to the case reference point).

4. Press OK. The Select Which Navigational Aids to Import dialog box appears.



5. Check the boxes next to the navigational aid(s) you wish to import, then press OK. The selected navigational aid(s) are added to your BaseOps case.

Chapter 27

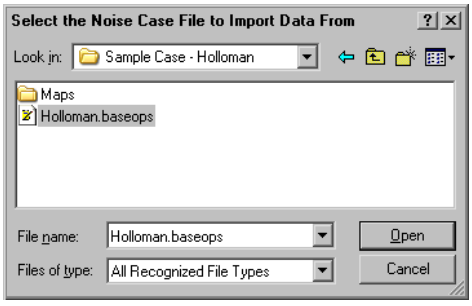
Importing Information from a Noise Case File

BaseOps allows you to import information into your current BaseOps case from a second noise case file. The imported case file can be a BaseOps `.baseops` or `.bps` file; an NMap/AAM/RNM `.ops` or `.opx` operations file; or an MRNMap `.inp`, `.ins` or `.inx` input file.

You can select the subset of information to import. For example, assume that you are calculating the noise impact of moving an F-16 fighter wing from one airfield to another. Furthermore, assume that you have BaseOps cases that model the existing conditions at both airfields. You can open the destination airfield's case, then import all F-16 flight profiles from the source airfield's case.

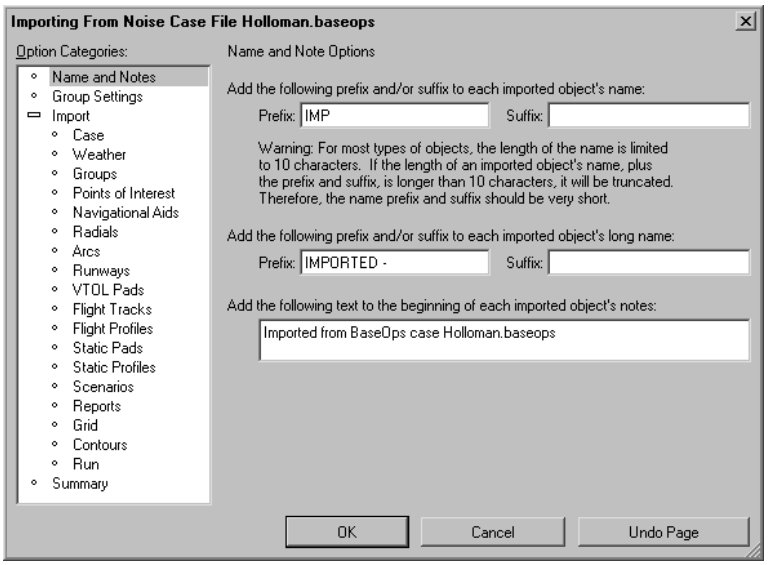
To import information from a noise case file, follow these steps:

1. Choose Import from Noise Case File from the File menu. The "Select the Noise Case File to Import Data From" dialog box appears.



2. Select the noise case file you wish to import from. Then press Open.

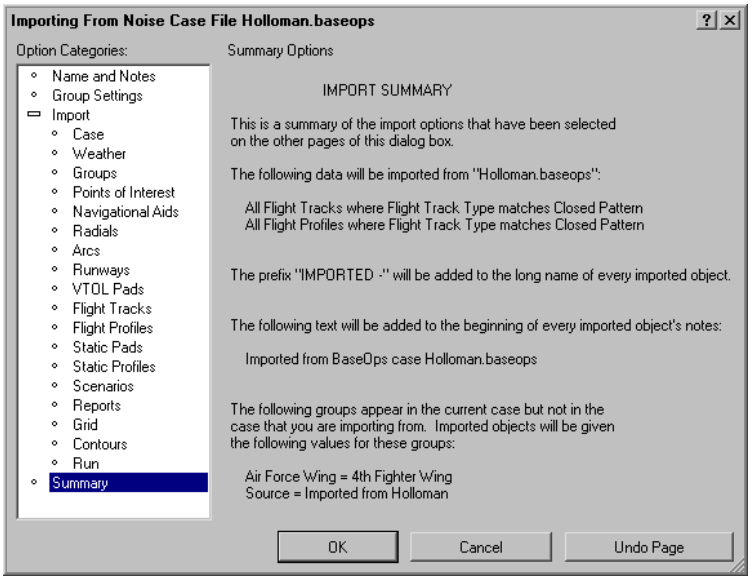
3. The "Importing From Noise Case File" dialog box appears.



The "Importing From" dialog box is a Multiple Page dialog box. See *Section B.2, Multiple Page Dialog Boxes*, for more information.

Visit each of the pages in the "Importing From" dialog box, and set the options as desired.

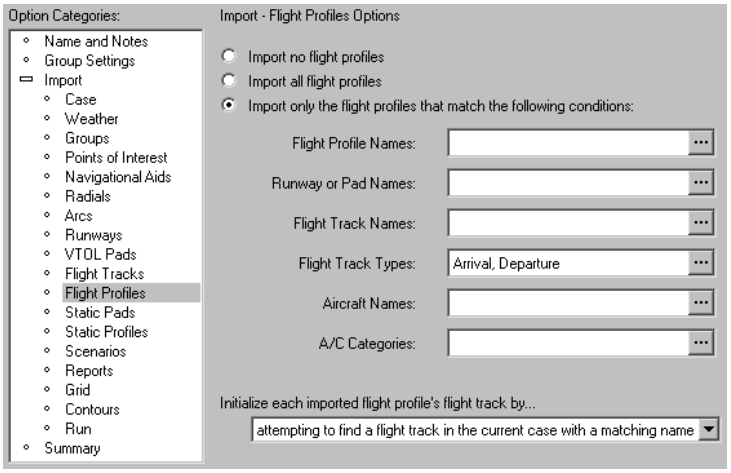
4. Go to the Summary page, and review the summary of the options you have selected.



5. Press OK, closing the "Importing From" dialog box. The requested information is imported into the current BaseOps case.

27.1. Selecting What Information to Import

Use the Import pages of the "Importing From" dialog box to select what information you wish to import.



There is one dialog box page for each type of object (runways, flight tracks) that can be imported. Visit each page and set the options as desired, noting these points:

- A BaseOps case can only contain one instance of some types of objects (for example, the weather object). If you import objects of this type, their data will replace the existing data in your case.

- A BaseOps case can contain any number of instances of some types of objects (for example, flight tracks). If you import objects of this type, they will be added to any existing objects already in your case. If you have existing objects with the same names as objects you import, you will wind up with multiple objects that have the same name, and will need to give each object a distinct name before your case can be run.

- Selecting the objects that will be imported is done in a similar manner to selecting the objects to display in the object list. See *Section 5.7, Filtering the Object List*, for more information.

- Some objects have fields that refer to other objects. For example, every flight profile has a flight track field, and every flight track has a runway field. You can select how these fields are initialized.

  As an example, consider flight profiles. You can select how the flight track field of each imported flight profile is initialized. You have two choices.

- *attempt to find a flight track in the current case with a matching name* - The existing case is searched for a flight track with the same name as the flight track that the profile referred to in the imported-from case. Typically, you will select this option if you **are** importing flight tracks along with the flight profiles.

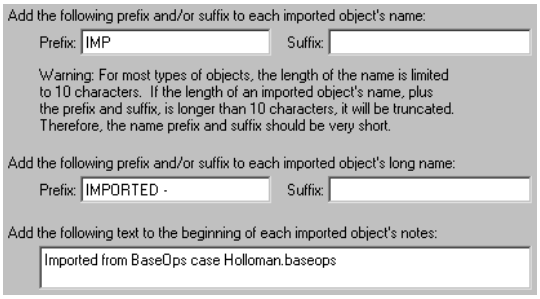
- *leave it undefined* - The flight track will be undefined. You will later need to manually select which flight track to associate with each imported flight profile. Typically, you will select this option if you **are not** importing flight tracks, but instead will be assigning the imported flight profiles to existing flight tracks in the current case.

Tip:

Use the Flight Track Assignment Tool to efficiently assign flight tracks to flight profiles. See *Section 30.1, Using the Assignment Tool*.

27.2. Modifying Imported Information

You can use the "Name and Notes" page of the "Importing From" dialog box to modify the text of each imported object's name, long name, and notes. This is useful for marking imported objects so that you can identify them as such in the future.



The name *Prefix* and *Suffix* are text added to the beginning and ending, respectively, of imported objects' short names.

Warning:

For most types of objects, the length of the name is limited to 10 characters. If the length of an imported object's name, plus the name prefix and suffix, is longer than 10 characters, the name will be truncated. Therefore, the name prefix and suffix should be very short.

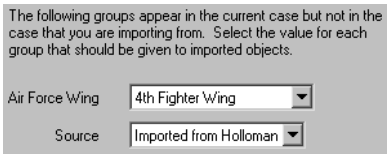
The long name *Prefix* and *Suffix* are text added to the beginning and ending, respectively, of imported objects' long names.

The text added to the beginning of imported objects' notes can contain any number of lines. Press the Enter key to insert additional lines.

Tip:

You can modify imported objects' notes to include import audit trail information, such as the BaseOps case imported from and the date the objects were imported.

Your current BaseOps case may contain groups that are not present in the case you are importing from. If so, the "Importing From" dialog box will contain the "Group Settings" page.



Use this page to select the initial values of these groups for the objects you are importing.

Tip:

It is often useful to mark imported objects so that they can be easily selected for further manipulation. For example, after importing flight profiles, you may wish to use the Pattern Altitude Tool to modify the imported profiles. The easiest way to do this is to use a group created especially for this purpose. Follow these steps.

1. In your current BaseOps case, create a new group called, say, *Source*. Make this group applicable to the types of objects you will be importing.

2. Give this group two choices. The first choice should be named, say, *Existing*. The second choice should be named, say, *Imported*. Or, if you will be importing from multiple cases, you can create a choice for each case.

3. Since *Existing* is the first choice, it will be the default value for this group. Therefore, the *Source* of all existing objects in your case will be set to *Existing*.

4. When importing from the other case, go to the Group Settings page of the Importing From dialog box and select the *Imported* value for the *Source* group. The *Source* of all imported objects will be set to *Imported*.

5. If you need to edit the imported objects, filter the object list (see *Section 5.7, Filtering the Object List*) to only show objects whose *Source* is set to *Imported*. You can then easily select all imported objects and, for example, run the Pattern Altitude Tool on them.

6. After you have finished editing the imported objects, you can delete the *Source* group. Alternatively, you can leave it to permanently document the source of each object.

Chapter 28

Importing Integrated Noise Model (INM) Cases

The United States' Federal Aviation Administration's Integrated Noise Model (INM) is commonly used to calculate the noise levels around civilian airports. BaseOps can import some information from INM cases.

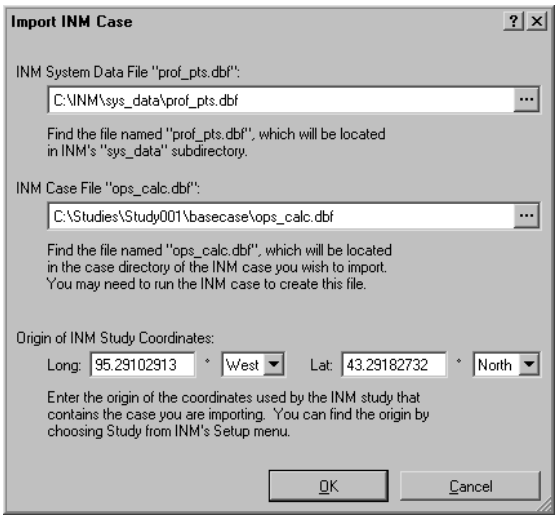
Important:

There are a number of differences between the ways that Noisemap/BaseOps and INM represent noise cases. For example, some INM flight tracks are point-to-point tracks (p-tracks), while all Noisemap flight tracks are represented using vectors.

Because of these differences, the typical INM cases will have data that BaseOps cannot import. Using BaseOps' "Import INM Case" feature should be viewed as merely the first step in converting an INM case into a BaseOps case. You should carefully check all imported INM cases to insure that no differences were introduced by the importation process.

To import an INM case, follow these steps.

1. Choose Import INM Case from the File menu. The Import INM Case dialog box appears.



2. *INM System Data File "prof_pts.dbf"* - Type the full path name of the INM system file named `prof_pts.dbf`. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

   This file will be located in the `sys_data` subdirectory of the INM directory.

3. *INM Case File "ops_calc.dbf"* - Type the full path name of the INM case file named `ops_calc.dbf`. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

   This file will be located in the case directory of the INM case you wish to import. You may need to run the INM case to create this file. The case directory will be a subdirectory of an INM study directory.

4. *Origin of INM Study Coordinates* - Enter the origin of the coordinates used by the INM study that contains the case you are importing. You can find the origin by choosing Study from INM's Setup menu.

5. Press OK. BaseOps imports as much data as it can from the INM case.

6. Carefully check the imported case. BaseOps will attempt to issue warning messages describing any problems it finds while importing the case. However, it cannot automatically detect all problems, so you must check the imported case even if you receive no warning messages.

Chapter 29

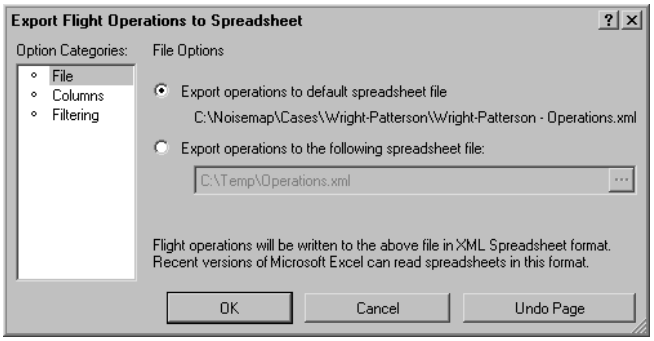
Editing Data With a Spreadsheet

Using BaseOps, you can edit all aspects of a BaseOps case. However, there may be situations where it is more convenient to edit data using Microsoft Excel. BaseOps gives you the ability to export and import portions of a BaseOps case's data to/from a spreadsheet file in XML format. For flight profiles, the operations counts can be edited in this manner. For static profiles, full round-trip editing of all static profile properties is supported.

29.1. Exporting Flight Operations to a Spreadsheet

To export the current case's flight operations to a spreadsheet, follow these steps.

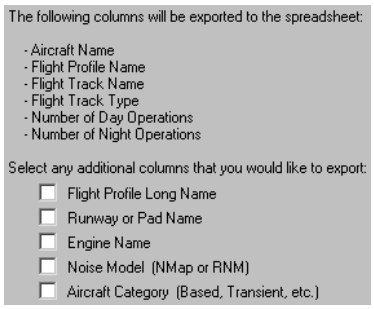
1. Choose Export Flight Operations to Spreadsheet from the File menu. The Export Flight Operations dialog box appears.



2. Go to the File page of the Export Flight Operations dialog box, and select the spreadsheet file to which you would like to export the operations. You can export to the default file, which will be the same as the BaseOps case file name, but with the suffix "`- Operations.xml`" added.

Alternatively, you can type a file name in the box provided. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

3. Go to the Columns page of the Export Flight Operations dialog box.



BaseOps will automatically export the following columns to the spreadsheet.

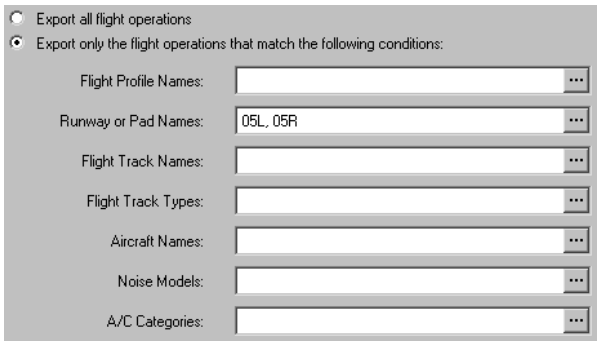
- Aircraft name
- Flight profile name
- Flight track name
- Flight track type (arrival, departure, etc.)
- Number of day operations
- Number of evening operations (if the case uses the evening period)
- Number of night operations

You can optionally export the following additional columns to the spreadsheet.

- Flight profile long name
- Runway or VTOL pad name
- Aircraft engine name
- Noise model used for the aircraft (NMap, AAM, etc.)
- Any groups that are applicable to flight profiles (such as aircraft category)

Check the box next to each additional column that you would like to export.

4. Go to the Filtering page of the Export Flight Operations dialog box.



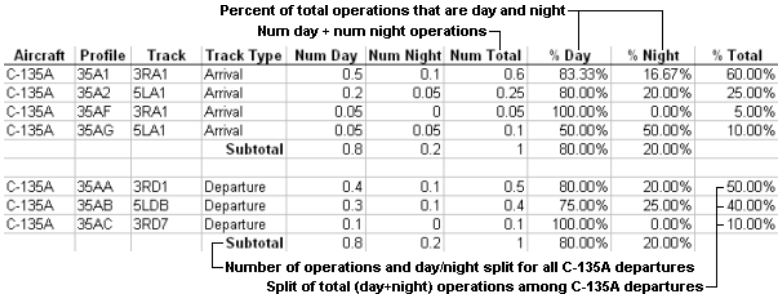
   By default, all flight operations in the current case are exported to the spreadsheet. If desired, you can export only a subset.

   Selecting the flight profiles to export is similar to selecting the objects to display in the object list. See *Section 5.7, Filtering the Object List*, for more information.

5. Press the OK button on the Export Flight Operations dialog box. The spreadsheet file is created, and the flight operations are written to it.

6. Start Microsoft Excel and open the spreadsheet. If your version of Excel is not capable of reading XML Spreadsheet files, you will need to get a later version.

The flight profiles in the exported spreadsheet are grouped by aircraft and flight track type. The spreadsheet includes extra columns (*Num Total*, *% Day*, *% Evening* [if the case uses the evening period], *% Night*, and *% Total*) and rows (*Subtotal*) that display statistics about the flight profile operations counts in each aircraft/track type group. These statistics are calculated by spreadsheet functions, so if you edit the operations counts using Excel, the statistics are automatically updated.



29.2. Importing Flight Operations from a Spreadsheet

To import flight profile operation counts from a spreadsheet, follow these steps.

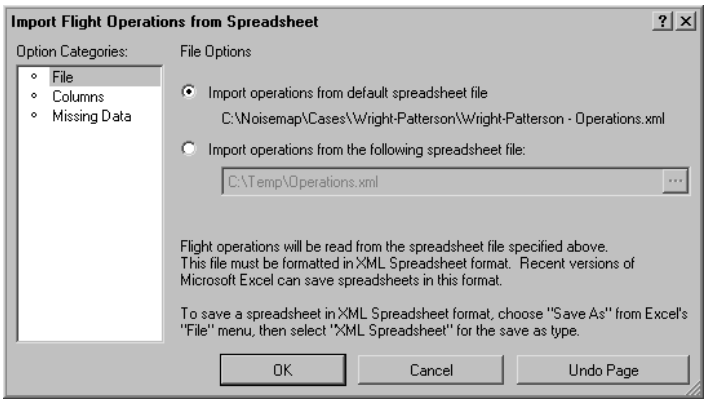
1. Using Microsoft Excel, create a spreadsheet containing the flight profile operation counts. At a minimum, this spreadsheet must contain the following columns.

   - Flight profile name
   - Number of day operations
   - Number of evening operations (if the BaseOps case uses the evening period)
   - Number of night operations

   The columns can appear in any order. It does not matter if the spreadsheet contains extra columns.

2. Save the spreadsheet to a file in XML Spreadsheet format. Choose Save As from Excel's File menu, then select *XML Spreadsheet* for the save as type. If your version of Excel is not capable of writing XML Spreadsheet files, you will need to get a later version.

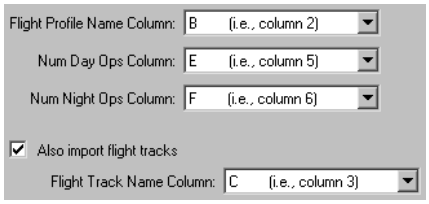
3. Choose Import Flight Operations from Spreadsheet from the BaseOps File menu. The Import Flight Operations dialog box appears.



4. Go to the File page of the Import Flight Operations dialog box, and select the spreadsheet file that you would like to import the operations from. You can import from the default file, which will be the same as the BaseOps case file name, but with the suffix " – `Operations.xml`" added.

Alternatively, you can type a file name in the box provided. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

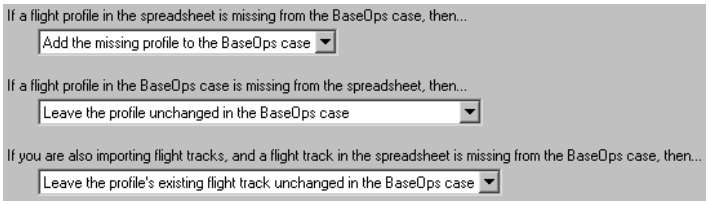
5. Go to the Columns page of the Import Flight Operations dialog box.



Select the columns in the spreadsheet that contain the required information. Columns are identified by either letter (A, B, C...) or number (1, 2, 3...), starting with the left-most column and counting to the right.

In addition to importing flight operation counts, you can optionally choose to import flight tracks. A column containing flight track names is specified, and the flight profiles in the BaseOps case are updated to use these tracks. To import flight tracks, check the *Also import flight tracks* box, and select the column containing the track names.

6. Go to the Missing Data page of the Import Flight Operations dialog box.



Select how to handle flight profiles that appear in the spreadsheet but not in the BaseOps case. You can either create new flight profiles in the BaseOps case, or else simply ignore the extra profiles in the spreadsheet.

Select how to handle flight profiles that appear in the BaseOps case but not in the spreadsheet. You can simply leave those flight profiles' operations counts unchanged. Alternatively, you can delete those profiles from the BaseOps case. Exercise care if you choose the second alternative; make sure that you really do want the extra flight profiles to be deleted.

If you are also importing flight tracks, select how to handle tracks that appear in the spreadsheet but not in the BaseOps case. You can leave the tracks of the affected profiles unchanged, set the tracks of the affected profiles to "undefined", or add the missing flight tracks to the BaseOps case. If you select the last alternative, you will later need to manually edit the properties (runway, segments, etc.) of the new flight tracks.

7. Press the OK button on the Import Flight Operations dialog box. A window appears, giving an overview of the flight profiles that will be modified. Press OK again, and the flight profile operations counts will be imported.

Tip:

When importing flight operations from a spreadsheet, BaseOps ignores any rows that have a blank flight profile name; a blank flight track name (if importing flight tracks); or a blank or non-numeric day, evening, or night operations count. This allows you to have rows in your spreadsheet (that contain, for example, operations count subtotals) that are ignored when importing. Simply insure that one of the above-mentioned columns in these rows does not contain any text.

29.3. Editing Static Profiles with a Spreadsheet

Static profiles can be edited with a spreadsheet in a similar manner to flight profiles. Since the process is similar, only the differences are described in this section. It is assumed that you are familiar with editing flight profiles using a spreadsheet: see *Section 29.2, Importing Flight Operations from a Spreadsheet*, and *Section 29.1, Exporting Flight Operations to a Spreadsheet*.

The key differences between editing flight and static profiles using a spreadsheet are:

- For flight profiles, only operation counts and, optionally, associated flight tracks, can be edited using a spreadsheet. For static profiles, all properties, including the static profile segment table, can be edited using a spreadsheet.

- For flight profiles, you can choose to export certain additional flight profile properties to the spreadsheet. For static profiles, all static profile properties are always automatically exported.

- For flight profiles, the column numbers in the spreadsheet are user-selectable. For static profiles, column numbers are fixed. Imported static profile spreadsheets much match the layout of exported static profiles spreadsheets as created by BaseOps.

Chapter 30

Editing Multiple Objects Simultaneously

BaseOps supports a number of tools that allow you to edit objects en masse. For example, you can select a number of flight profiles and assign them to a flight track in a single operation. While these tools don't provide additional functionality — you can achieve the same effect by editing each object individually — they make mass editing much more efficient.

To use a tool, select it from the Tools menu. The available tools will vary, depending on the type of object you are currently editing.

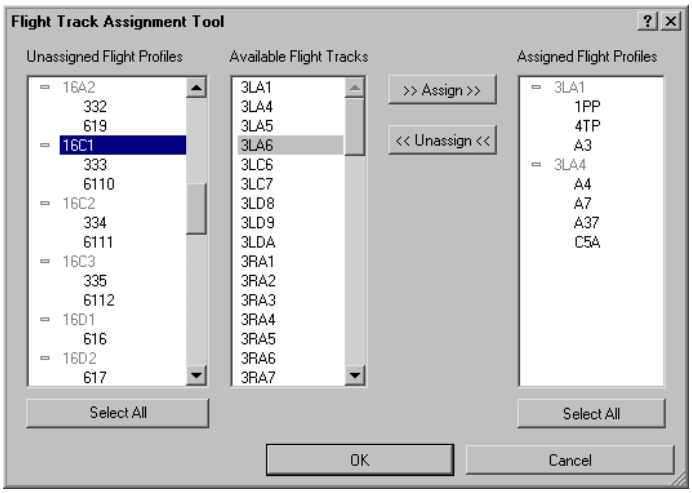
30.1. Using the Assignment Tool

Use the Assignment Tool to efficiently assign a value to certain object fields. You can use it to set the value of any applicable group: for example, the flight profile's A/C Category field. You can also use it to set the value of fields that refer to other objects: for example, the flight profile's flight track field, or the static profile's static pad field.

In the following description, the Flight Track Assignment Tool is used as an example. However, everything below is applicable to all of the assignment tools.

The use the Flight Track Assignment Tool, you must be editing flight profiles. The tool is accessed by choosing Flight Track Assignment Tool from the Tools menu. You can choose to run the tool on every flight profile with an undefined flight track. Alternatively, you can choose to run the tool on every flight profile currently selected in the object list: see *Section 5.9, Selecting Multiple Objects*.

After choosing the tool from the menu, the Flight Track Assignment Tool dialog box appears.



To use the tool, select one or more flight profiles from the unassigned flight profiles list (see *Section 5.9, Selecting Multiple Objects*), select a flight track from the available flight tracks list, the press the Assign button. The selected flight profiles will be moved to the assigned flight profiles list, and the flight track field of each will be set to the selected flight track.

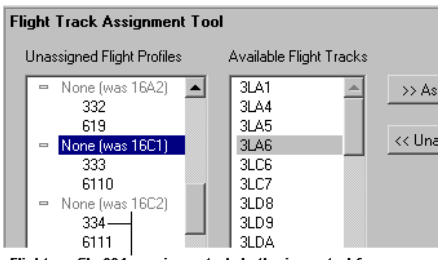
To correct mistakes, select flight profiles from the assigned flight profile list, then press the Unassign button to move them back to the unassigned list. The original value of each profile's flight track field is restored.

Use the Select All buttons to quickly select all flight profiles in the corresponding lists.

Any flight profiles remaining in the unassigned list when the dialog box is closed are left unchanged.

Tip:

If you imported the flight profiles from another BaseOps case (see *Chapter 27, Importing Information from a Noise Case File*), then the previous flight track names from the old imported-from case will be visible in the unassigned list of the Flight Track Assignment Tool.



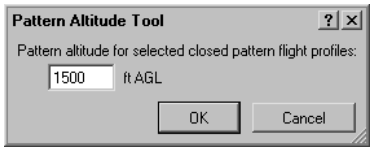
Flight profile 334 was imported. In the imported-from case, flight track 16C2 was associated with this profile.

30.2. Using the Pattern Altitude Tool

Use the Pattern Altitude tool to change the pattern altitude (i.e., the level-flight section) of a set of closed pattern flight profiles. At a particular airfield, the pattern altitude is often constant for a given aircraft; however, it varies from airfield to airfield. Therefore, when moving flight profiles from one airfield to another, it is useful to be able to change pattern altitudes en masse.

The pattern altitude is the maximum altitude reached by a flight profile. If the maximum profile altitude is less than the new pattern altitude, then all profile segments with the old maximum profile altitude are set to the new pattern altitude. If the maximum profile altitude is greater than the new pattern altitude, then all profile segments with altitudes above the new pattern altitude are set to the new pattern altitude.

To use the tool, select one or more flight profiles in the object list (see *Section 5.9, Selecting Multiple Objects*), then choose Pattern Altitude Tool from the Tools menu. The Pattern Altitude Tool dialog box appears.



Type the desired pattern altitude above ground level, then press OK. The pattern altitude of each selected closed pattern flight profile is changed.

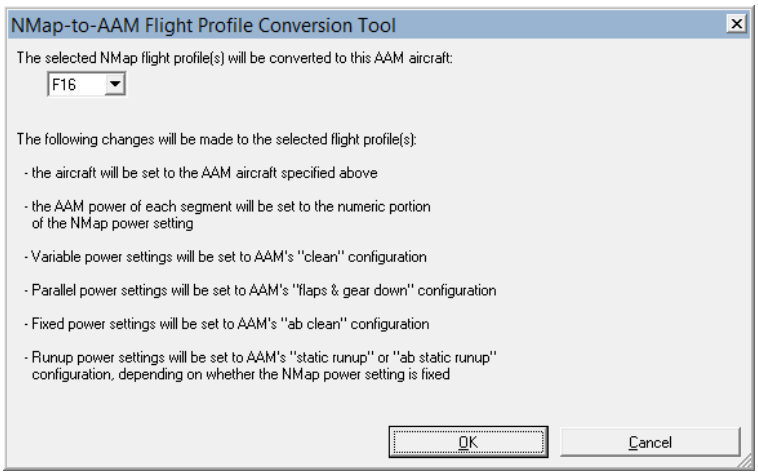
Note:

Non-pattern (arrival, departure, etc.) flight profiles are ignored by the pattern altitude tool, as are flight profiles with undefined flight tracks.

30.3. Using the NMap-to-AAM Flight Profile Conversion Tool

Use the NMap-to-AAM Flight Profile Conversion tool to convert NMap flight profiles into AAM profiles. The profiles' aircraft, power, and aircraft configuration fields are set to match an AAM aircraft that you choose.

To use the tool, select one or more flight profiles in the object list (see *Section 5.9, Selecting Multiple Objects*), then choose NMap-to-AAM Flight Profile Conversion Tool from the Tools menu. The NMap-to-AAM Flight Profile Conversion Tool dialog box appears.



Choose the desired AAM aircraft, then press OK. The selected NMap flight profiles are converted into AAM profiles.

Note:

The precise changes made to the flight profiles are listed at the bottom of the NMap-to-AAM Flight Profile Conversion Tool dialog box.

Note:

Non-NMap flight profiles are ignored by the tool.

Chapter 31

Using Scenarios

Every BaseOps case contains one or more *scenarios*. A scenario is a set of case modifications, such as scaling the number of flight profile operations or deleting static profiles. When you run the case, a noise analysis is performed for each scenario: see *Chapter 32, Running Cases*.

When a new case is created, it contains a single scenario named "Baseline". This baseline scenario does not modify the case. In many situations, this is the only scenario required.

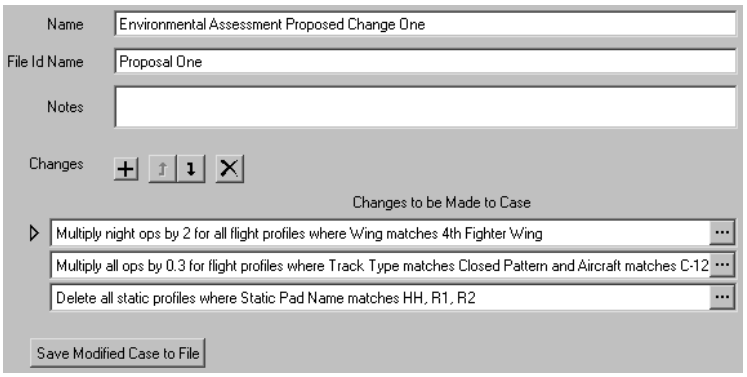
However, you may sometimes need to perform a noise analysis for two or more situations, to compare the noise impact of each alternative. For example, when performing an environmental assessment for a proposed change to an airfield's operations, it is common to perform one noise analysis of the existing noise impact, and another noise analysis of the predicted noise impact after the proposed change is implemented.

Without scenarios, this could only be done by creating separate BaseOps cases for each noise analysis. Using scenarios, however, you can keep all information in a single case. This brings many advantages. Typically, a large fraction of the information is common to all of the alternative cases. Keeping all of the information in a single BaseOps case reduces the amount of information that must be redundantly entered and kept synchronized.

31.1. Working With Scenarios

To work with scenarios, choose Scenarios from the object type selector dropdown list. Scenarios can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit a scenario, first select it in the object list, then edit its properties in the text pane.



Scenarios have the following properties.

- *Name* - A descriptive name that uniquely and unambiguously identifies the scenario. There is no length restriction on the name.

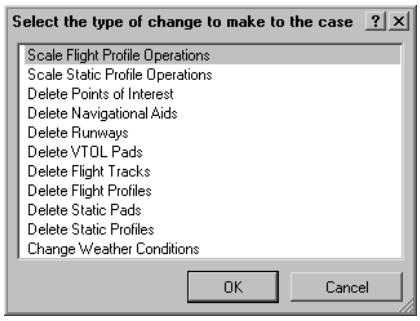
- *File Id Name* - A short (40 characters maximum) descriptive name that identifies this scenario. Every scenario in a case must have a unique file id name. All files created while running a scenario will be located in the same directory as the containing `.baseops` case file, and will be of the form `CASENAME – FILEIDNAME – FILETYPE.EXTENSION`, where CASENAME is the name of the `.baseops` case file, FILEIDNAME is the file id name specified here, and FILETYPE and EXTENSION identify the type of the file (NMap input file, RNM log file, etc.).

  If desired, the file id name can be empty. This would typically be done in cases that contain only a single scenario.

- *Notes* - Miscellaneous information about the scenario. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

- *Changes* - The changes to be made to the BaseOps case to create the scenario case.

  To add a new change, either press the Add Change button +, or press Ctrl + A. The Select Type of Change dialog box appears.



Select the type of change you would like to make to the case, then press OK. The change is added to the scenario.

To edit a change, press the Edit button next to that change. A dialog box appears that allows you to edit the change's options. See *Section 31.2, Types of Scenario Changes*, for a description of the options associated with each type of change.

To delete a change, either press the Delete Choice button, or press Ctrl + Del.

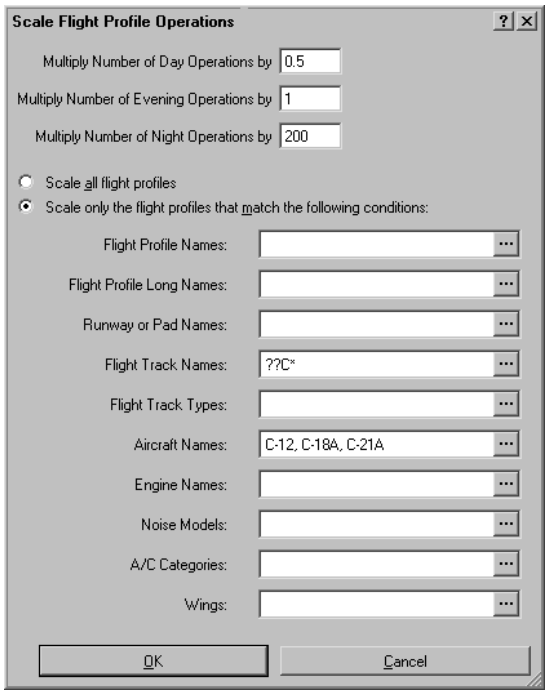
To move a change up or down in the table, press the Move Up and Move Down buttons and, or press Ctrl + U and Ctrl + D. Changes are applied in order, starting from the top of the list and working down.

31.2. Types of Scenario Changes

31.2.1. Scale Operations Scenario Change

Use the Scale Operations scenario change to modify the number of day, evening (if applicable), and night operations for flight, airspace and static profiles. Only flight profile scaling is describe here; airspace and static profile scaling is performed in an analogous manner.

To scale flight profile operations, add a Scale Flight Profile Operations change to a scenario, then edit the change's options (see *Section 31.1, Working With Scenarios*). The Scale Flight Profile Operations dialog box appears.



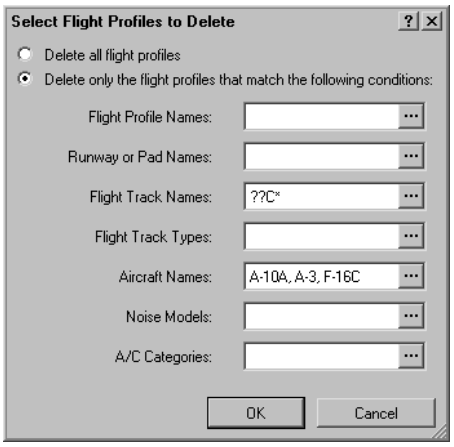
Enter the factors by which the number of day, evening (if applicable), and night operations will be multiplied. A factor of 2 would double the number of operations, and 0.5 would halve them. Entering 1 for the scale factor would leave the number of operations unchanged.

Select the flight profiles whose operations will be scaled. This is done in a similar manner to selecting the objects to display in the object list. See *Section 5.7, Filtering the Object List*, for more information.

31.2.2. Delete Objects Scenario Change

Use the Delete Objects scenario change to delete objects (flight tracks, static profiles, etc.). Only flight profile deletion is describe here; the deletion of other types of objects is performed in an analogous manner.

To delete flight profiles, add a Delete Flight Profiles change to a scenario, then edit the change's options (see *Section 31.1, Working With Scenarios*). The Select Flight Profiles to Delete dialog box appears.

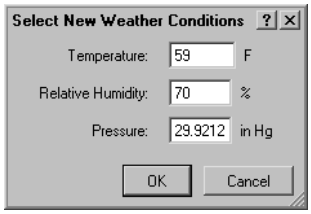


Select the flight profiles that will be deleted. This is done in a similar manner to selecting the objects to display in the object list. See *Section 5.7, Filtering the Object List*, for more information.

31.2.3. Change Weather Conditions Scenario Change

Use the Change Weather Conditions scenario change to modify the scenario's weather conditions. You can specify a new temperature, relative humidity, and atmospheric pressure to use when running the scenario.

To change weather conditions, add a Change Weather Conditions change to a scenario, then edit the change's options (see *Section 31.1, Working With Scenarios*). The Select New Weather Conditions dialog box appears.



Select the new weather conditions. See *Chapter 11, Setting Weather Conditions*, for more information.

31.3. Saving a Scenario as a New Case

If desired, you can save a scenario as a new case file. This is rarely necessary, but BaseOps gives you this capability for exceptional circumstances.

To save a scenario as a new case file, press the Save Modified Case to File button. You will be prompted for the name of the new `.baseops` case file that will be created.

Caution:

The "save modified case to file" feature should be used sparingly. If possible, keep all scenarios in a single BaseOps case. This allows you to share those parts of the case that are common between multiple scenarios. This makes changes much easier. For example, if a flight track used by aircraft from multiple scenarios must be modified, the change only needs to be made in one place.

Chapter 32

Running Cases

After entering all of the data (runways, flight tracks, weather information, etc.) in a BaseOps case, you can *run* the case: that is, execute the noise model(s) that compute the predicted noise levels. To run the case, select Run Case from the Case menu.

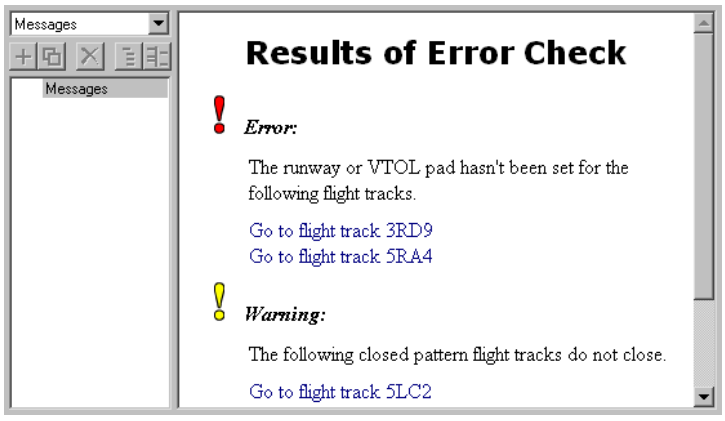
This chapter covers the details of running a case, along with other associated tasks such as checking a case for errors and viewing noise contours using NMPlot.

32.1. Checking a Case

To check a case for errors and warnings, you can:

- Choose Check Case from the Case menu
- Press Ctrl + K

The *message report* is displayed, showing any errors or warnings found.



Errors must be corrected before the case is run. Warnings do not, but you should carefully consider each one.

To fix errors in the case, click on the hyperlinks included in the message report. These hyperlinks take you to the objects that you must edit to correct the errors.

Tip:

After following a hyperlink, use the back button to easily return to the message report. See *Section 5.8, Using the Back and Forward Buttons*.

At any time, you can go to the message report and view the results of the last error check by choosing Messages from the object type selector dropdown list.

You can print the message report. See *Section 5.4, Printing Objects*.

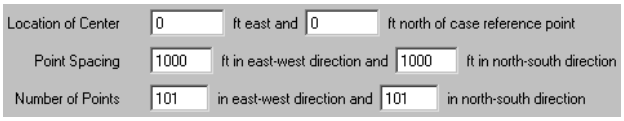
32.2. Setting Grid Properties

The noise models calculate noise levels at a two-dimensional grid of points covering your area of interest. You can set the grid's location, size, and resolution (distance between adjacent points).

Note:

The grid is always orientated so that its rows and columns run east-west and north-south.

To set the properties of your case's grid, first choose Grid from the object type selector dropdown list. Then set the grid properties in the text pane.



The grid has the following properties.

- *Location of Center* - The location of the center of the grid, specified with respect to the case reference point. Typically, the reference point is located near the center of the area of interest, so the grid location will usually be close to (0, 0).

  Note:

  The grid location is always specified with respect to the case reference point, regardless of the current case coordinate system.

- *Point Spacing* - The distance between adjacent grid points in the east-west and north-south directions.

- *Number of Points* - The number of grid points in the east-west and north-south directions. The size of the area covered by the grid equals the number of grid points multiplied by the grid point spacing.

 ***Note:***

You can select the units used to specify the grid properties. See *Section 4.9, Setting the Case's Physical Units*, for more information.

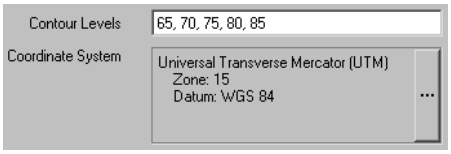
32.3. Setting Contour Properties

As the final step in running a case, BaseOps exports each scenario's noise level contours to a file in ARC/INFO Shapefile format. You can then import the contours into a third-party Geographic Information System (GIS). Most GIS's can import shapefiles.

 ***Note:***

The NMPlot plotting application can also create contour shapefiles. BaseOps' contour exporting capability is provided as a convenience to those users whose contouring needs are relatively straight-forward. User with more demanding needs should use NMPlot: see *Section 32.5, Plotting Noise Contours*.

To set the properties of the exported contours, first choose Contours from the object type selector dropdown list. Then set the contour properties in the text pane.



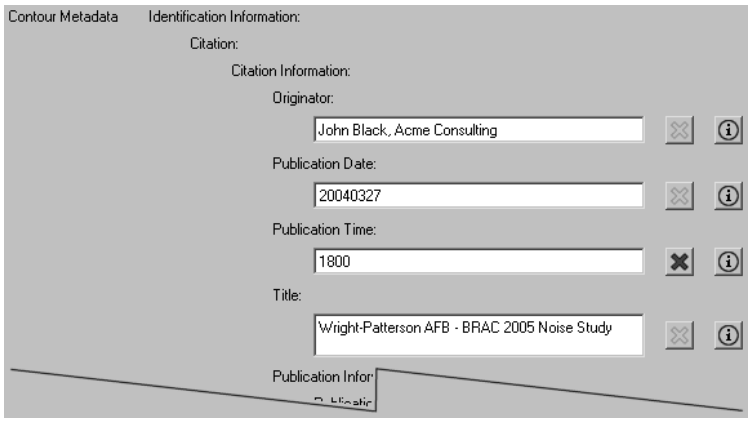
The following contour properties can be set.

- *Contour Levels* - Type one or more numbers (separated by commas) specifying the desired noise level(s) of the contours. The contour levels are specified in dB's in the noise metric selected when the case is run: see *Section 32.4.1, Noise Metric*.

- *Coordinate System* - Select the geographic coordinate system of the contour shapefiles. See *Section 37.1, Coordinate System Control*, for more information.

When BaseOps creates a noise contour shapefile, it also creates a metadata file containing information about the shapefile. This metadata file conforms to the Federal Geographic Data Committee's Content Standard for Digital Geospatial Metadata (FGDC-STD-001-1998).

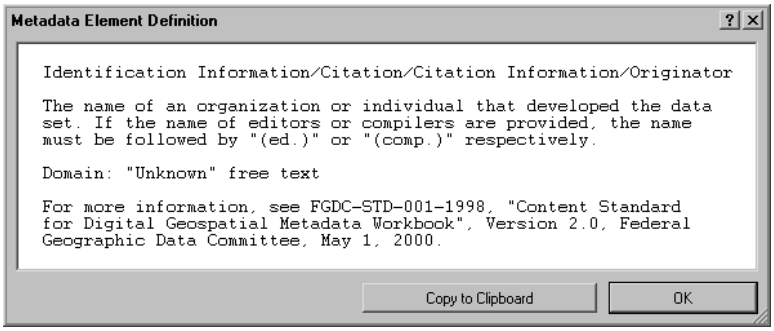
Using information drawn from the case, BaseOps can create a reasonable metadata file automatically. However, some users may wish to fine-tune the metadata. Therefore, BaseOps allows you to review the default metadata and, if desired, edit it on an element-by-element basis.



Initially, all metadata elements will have default values assigned to them. For example, the `Citation/Title` element's default value is the BaseOps case's case name. If you later edit the case name, this element's value will be automatically updated.

You can edit the information displayed in any of the text boxes. When you do, the Reset Element button will be enabled. This indicates that you have overridden the metadata element's default value. Once you have overridden an element's default value, its value is fixed; it will no longer be automatically updated by BaseOps. To restore the element's default value, press the Reset Element button.

Press the Show Element Definition button to display a metadata element's documentation from the FGDC standard.



Note:

BaseOps is not intended to be a general-purpose metadata editor. The FGDC metadata standard defines a large number of elements. The metadata files generated by BaseOps

only contain those elements that are expected to be commonly applicable to Noisemap noise contour shapefiles.

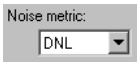
Furthermore, BaseOps' Contours page only displays those elements for which there was judged to be a reasonable likelihood that a user would need to override the default value. Elements whose values could be unambiguously calculated (for example, the bounding coordinates) are not displayed on the Contours page, but are included in the metadata file.

Should you have exceptional needs, you can use a third-party metadata editor (or, in its absence, a simple text editor) to fine-tune the generated metadata file. If there are FGDC metadata elements that BaseOps currently does not support, but that you believe are generally applicable to noise contour shapefiles, then contact BaseOps' developers. It may be possible to include those elements in a future version.

32.4. Setting Run Options

There are numerous options that affect the computations performed when you run a BaseOps case. To set these options, first choose Run from the object type selector dropdown list. Then set the options in the text pane.

32.4.1. Noise Metric



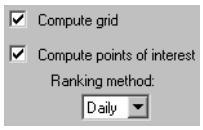
There are several commonly-used mathematical methods for calculating a single scalar number representing the impact of noise at a location. These are referred to as *noise metrics*.

Select the noise metric that will be calculated when the case is run. Note that only those metrics applicable to the selected noise model(s) are displayed: see *Section 10.3, Noise Models*,

Name	Description	Supporting Noise Models
ALM	Maximum A-weighted Sound Level for single user-selected flight or static profile.	NMap, AAM
AMAX	Maximum A-weighted Sound Level	AAM
CDNL	C-weighted Day-Night Average Sound Level	AGM
CNEL	Community Noise Equivalent Level	all but AGM

CNELR	Onset-rate-adjusted Community Noise Equivalent Level	MRNMap
DNL	Day-Night Average Sound Level	all but AGM
LDNMR	Onset-rate-adjusted Monthly Day-Night Average A-weighted Sound level. PHA (percent highly annoyed) is also calculated.	MRNMap
LEQ	Equivalent Sound Level (user-selected number of hours). Note that the LEQ noise metric is depreciated. Use LEQA with newer versions of NMap and AAM.	NMap, AAM
LEQA	Equivalent Sound Level (user-selected number of hours)	NMap, AAM
LEQ24	Equivalent Sound Level (24-hour)	MRNMap, RNM
LMAX	Maximum A-weighted Sound Level	MRNMap
NASEL NAALM	Number of Events Above a user-selected threshold SEL/ALM level	NMap, AAM
NAPNLT	Number of Events Above a user-selected threshold PNLT level	AAM
NEF	Noise Exposure Forecast	NMap, AAM, RNM
PA	Probability of Awakening	NMap, AAM
PEAK	Peak Sound Level	AGM
SEL	Sound Exposure Level for single user-selected flight profile. Note that the SEL noise metric is depreciated. Use SELA with newer versions of NMap and AAM.	NMap, AAM
SELA	Sound Exposure Level for single user-selected flight profile.	NMap, AAM
SEL (all ops)	Sound Exposure Level (all operations)	MRNMap
SELR	Onset-rate-adjusted Sound Exposure Level	MRNMap
SELU	Unweighted Sound Exposure Level	MRNMap
TAALM	Time Above (in minutes) a user-selected threshold ALM	NMap, AAM
WECPNL	Weighted Equivalent Continuous Perceived Noise Level	NMap, AAM, RNM

32.4.2. Computations Performed



Each of the noise models supported by BaseOps can calculate noise levels (in the selected metric) at a two-dimensional grid of locations. All but AGM can also perform a detailed noise analysis at each of the case's points of interest.

Select whether you would like to perform grid noise computations, points of interest noise computations, or both.

If you choose to perform points of interest computations, a points of interest report will be created. For each point of interest, this report will include a table of the flight and static profiles that contribute the most to the noise level at that point. The NMap, AAM, and RNM noise models allow you to select the method used to rank the profiles. You have two choices.

- *Daily* - Profiles are ranked by their contribution to the daily noise level.
- *Event* - Profiles are ranked by their single-event noise levels.

32.4.3. Noise Calculation Cutoff

As an optimization, the MRNMap noise model will ignore individual noise events with an SEL sound level below a user-defined noise calculation cutoff. See the MRNMap documentation for more information.

The AGM noise model supports a similar cutoff parameter.

32.4.4. Elevation and Ground Impedance

When computing noise levels, the NMap, AAM, and RNM noise models can optionally consider terrain elevation and ground impedance. Check the *Use elevation and ground impedance* box, then type the names of the elevation and ground impedance files. If you used BaseOps to create the elevation and ground impedance files, then the correct file names should already be set. See *Chapter 12, Editing Elevation and Ground Impedance Data*, for more information.

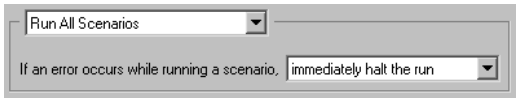
 ***Note:***

Be aware that the noise models run significantly slower when considering the effects of terrain.

 ***Note:***

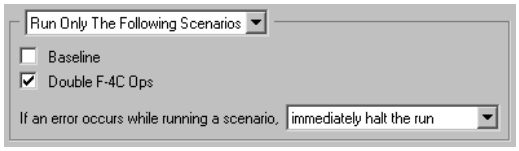
The AGM noise model requires that the elevation and ground impedance grids be present.

32.4.5. Scenarios to Run



Every BaseOps case contains one or more *scenarios*. See *Chapter 31, Using Scenarios*. When you run a case, a noise analysis is typically performed for each scenario.

You may sometimes wish to run only some of the scenarios in the case. In this situation, select *Run Only The Following Scenarios* from the dropdown list. A list of the scenarios in the case is displayed.



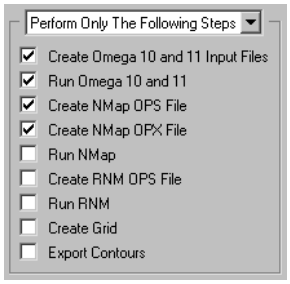
Check the box next to each scenario that you wish to run. At least one scenario must be checked.

If you are running more than one scenario, select how BaseOps should respond if an error occurs while running a scenario. You have two choices.

- *immediately halt the run* - BaseOps immediately terminates and displays the error message.
- *attempt to run other scenarios* - BaseOps halts the current scenario, but attempts to run any remaining scenarios. After all scenarios are attempted, a summary of the error(s) that occurred is displayed. This is useful if you leave BaseOps unattended (for example, overnight) while running a computationally intensive case.

32.4.6. Steps to Perform

Running a BaseOps case consists of a number of steps (creating the NMap input file, executing the AAM noise model, etc.). Typically, you will want to perform all of the steps. However, there may be situations where you only want to perform some of them. In this situation, select *Perform Only The Following Steps* from the dropdown list. A list of the steps is displayed.



Only those steps that are relevant to the selected noise models are shown. See *Section 10.3, Noise Models*, for more information.

Check the box next to each step that you wish to perform. At least one step must be checked. The following steps are defined.

- *Create Omega 10 and 11 Input Files for NMap Operations* - Omega10 and Omega11 are the United States Department of Defense's computer programs for extrapolating measured noise data. This step creates input files used to run these programs for NMap operations. The input file names will end in the text `NMap - Omega10.i10` and `NMap - Omega11.i11`. See the NMap documentation for more information.

- *Run Omega 10 and 11 for NMap Operations* - Run the Omega10 and Omega11 programs for NMap operations. The Omega output file names will end in the text `NMap - Omega10.o10` and `NMap - Omega11.o11`, and the Omega log file names will end in the text `NMap - Omega10.log` and `NMap - Omega11.log`. See the NMap documentation for more information.

- *Create NMap OPS File* - Create the NMap OPS file. The OPS file name will end in the text `NMap.ops`. See the NMap documentation for more information.

- *Create NMap OPX File* - Append the Omega 10 and 11 NMap noise profiles to the OPS file to create the NMap OPX input file. The OPX file name will end in the text `NMap.opx`. See the NMap documentation for more information.

- *Run NMap* - Run the NMap noise model. The NMap grid, point of interest, and log file names will end in the text `NMap.grd`, `NMap.poi`, and `NMap.log`, respectively. See the NMap documentation for more information.

Note:

The grid and point of interest files will only be created if you selected to perform grid and point of interest computations, respectively. See *Section 32.4.2, Computations Performed*.

- *Create Omega10R Input Files for MRNMap Operations* - Create input file used to run the Omega10R program for MRNMap operations. The input file name will end in the text `MRNMap - Omega10.i10`. See the MRNMap documentation for more information.

- *Run Omega10R for MRNMap Operations* - Run the Omega10R program for MRNMap operations. The Omega10R output and log file names will end in the text `MRNMap - Omega10.o10` and `MRNMap - Omega10.log`, respectively. See the MRNMap documentation for more information.

- *Create MRNMap INS File* - Create the MRNMap INS file. The INS file name will end in the text `MRNMap.ins`. See the MRNMap documentation for more information.

- *Create MRNMap INX File* - Append the Omega10R noise profiles to the INS file to create the MRNMap INX input file. The INX file name will end in the text `MRNMap.inx`. See the MRNMap documentation for more information.

- *Run MRNMap* - Run the MRNMap noise model. The MRNMap grid, point of interest, and log file names will end in the text `MRNMap.grd`, `MRNMap.poi`, and `MRNMap.log`, respectively. See the MRNMap documentation for more information.

Note:

The grid and point of interest files will only be created if you selected to perform grid and point of interest computations, respectively. See *Section 32.4.2, Computations Performed*.

- *Create AAM OPS File* - The AAM OPS input file is created. This file's name will end in the text `AAM.ops`. See the AAM documentation for more information.

- *Run AAM* - Run the AAM noise model. The AAM grid, point of interest, and log file names will end in the text `AAM.grd`, `AAM.poi`, and `AAM.log`, respectively. See the AAM documentation for more information.

Note:

The grid and point of interest files will only be created if you selected to perform grid and point of interest computations, respectively. See *Section 32.4.2, Computations Performed*.

- *Run AGM* - Run the AGM noise model. For each attack run, the DefineRun, AirGunneryModel, and BoomModel programs are executed. Then a combined grid, representing the total summed noise from each attack run, is created. Scaling for munition expenditures and day/evening/night splits happens during the summing stage.

Note:

The attack runs processed by the AGM programs can be affected by NoiseMake. See *Section 32.4.7, NoiseMake*.

- *Create RNM OPS File* - The RNM OPS input file is created. This file's name will end in the text `RNM.ops`. See the RNM documentation for more information.

- *Run RNM* - Run the RNM noise model. The RNM grid, point of interest, and log file names will end in the text `RNM.grd`, `RNM.poi`, and `RNM.log`, respectively. See the RNM documentation for more information.

Note:

The grid and point of interest files will only be created if you selected to perform grid and point of interest computations, respectively. See *Section 32.4.2, Computations Performed*.

- *Create Grid* - Create the final noise grid. The output grids from the other noise models are summed, if necessary, and additional grid metadata (description of the Noisemap case and scenario, details of the scenario's flight tracks, points of interest, etc.) is added to the grid.

  The final grid will be named *`casename – scenarioname`*`.grd`, where *casename* is the name of the `.baseops` case file and *scenarioname* is the scenario file id name.

  To view the final noise grid, choose Plot from the Case menu. See *Section 32.5, Plotting Noise Contours*.

- *Export Contours* - Export noise level contours to a file in ARC/INFO Shapefile format. The shapefile will be written to a file that ends in the text `Contours.shp`. Shapefile index, shapefile attribute, coordinate system projection, and FGDC metadata files will also be created; these will end in the text `Contours.shx`, `Contours.dbf`, `Contours.prj`,

and `Contours.shp.xml`, respectively. See *Section 32.3, Setting Contour Properties*, for more information.

Warning:

If you choose to run only some steps, you are responsible for insuring that the proper steps are run at the proper times. For example, if you run the "Create NMap OPX File" step, then make changes to the case, and then run the "Run NMap" step, NMap will run using the previously created OPX file, which doesn't contain the most recent changes made to the case. BaseOps does not check for mistakes of this kind.

Note:

All of the steps create one or more files. These files will be located in the same directory as the `.baseops` case file, and will begin with the name of the case file, followed by the scenario file id name. For example, if the case file is named `Wright-Patterson.baseops` and the scenario file id name is `Baseline`, then the Omega 10 input file will be named `Wright-Patterson - Baseline - Omega10.i10`.

Note:

In addition to the primary OPX/OPS input file, some noise models (specifically, NMap, AAM, and RNM) take an additional input file: the RUN file.

BaseOps creates RUN files during the *Run NMap/AAM/RNM* steps. However, these RUN files cannot be used to run the noise models directly. This is because BaseOps supports long file names, but the RUN file format only supports DOS-style 8.3 file names. Therefore, when BaseOps runs a case, it must use temporary 8.3 file names for all input and output files. The RUN files BaseOps creates refer to these temporary files.

There are no RUN file options that can't be set using BaseOps. Therefore, as long as the noise models are run from within BaseOps, the fact that the RUN file refers to these temporary files is irrelevant to you. However, if you wish to run the noise models independently of BaseOps, you will need to manually copy all input files to the appropriate temporary files. See the notes at the end of a BaseOps-generated RUN file for more information.

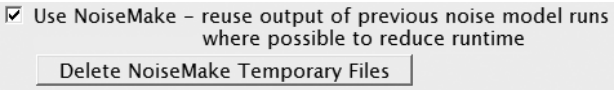
32.4.7. NoiseMake

NoiseMake is a feature of BaseOps that can substantially reduce noise model running time when editing a BaseOps case. When NoiseMake is active, output from previous noise model runs is reused when possible.

Currently, NoiseMake has been implemented for only one noise model: AGM. When the feature is active, AGM is run on each attack run separately, and the output is saved. Subsequently, if the case is edited and then rerun, only those attack runs whose data has changed are processed; the AGM output for the other attack runs is reused.

The temporary output are stored in a directory named *CASENAME* – Cache, where *CASENAME* is the name of the BaseOps case file.

To turn on NoiseMake, check the *Use NoiseMake* box.



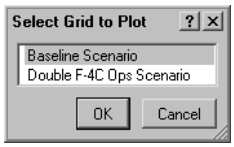
Press the *Delete NoiseMake Temporary Files* button to delete all the temporary NoiseMake files and reclaim the disk space. The next time you run the case, BaseOps will invoke the appropriate noise model(s) and recalculate these files on an as-needed basis. However, depending on the size of the case, recalculating the files may take a considerable amount of time.

32.5. Plotting Noise Contours

After a case has been run, you can use the NMPlot plotting application to display contours of the predicted noise levels. To do so, choose Plot from the Case menu. NMPlot will be started, displaying a contour plot of your case's noise level grid file.

The first time that a grid file is displayed using NMPlot, an NMPlot plot file will be created. This file will have the extension `.nmp`. If you customize the plot (change the contour levels, add background maps, etc.), the changes will be stored in this file. You can open and edit this file with NMPlot even if BaseOps is not running.

If your case has multiple scenarios, then you will have multiple noise level grid files. In this situation, when you choose Plot from the Case menu, a dialog box will appear, asking you which scenario's grid file you wish to plot.



Select a scenario, then press OK.

Select Contents from NMPlot's Help menu to display the NMPlot User's Guide, which describes NMPlot in detail.

Chapter 33

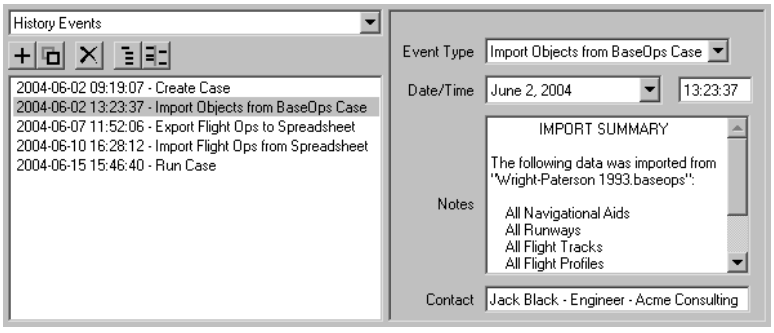
Using Case History

BaseOps' case history feature records the major events that occur as you edit a BaseOps case. Examples of such events include creating the case, importing data from a spreadsheet, and running the case. Each history event includes the time and date that the event occurred, and contact information for the person who performed the event.

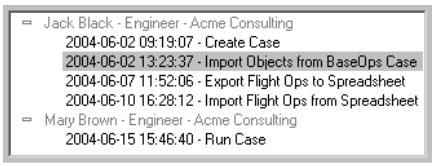
BaseOps can be configured to automatically record major events as they occur. Alternatively, you can maintain the case history by manually adding and editing case history events.

33.1. Viewing a Case's History

To view a case's history, choose History Events from the object type selector dropdown list. The history events are displayed in the object list on the left side of the BaseOps window. Select an event to display its details.



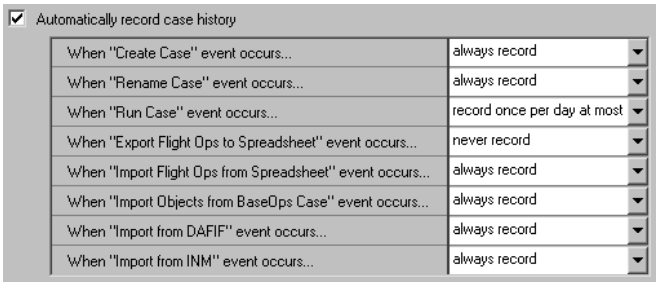
You can sort and filter the events by a number of criteria, including date, contact information, and event type. See *Section 5.6, Sorting and Grouping the Object List*, and *Section 5.7, Filtering the Object List*.



A case's history sorted by contact information.

33.2. Automatically Recording a Case's History

BaseOps can automatically record major events that occur as you edit a case. To activate automatic history recording, choose Application Options from the Tools menu, go to the History page, then check the *Automatically record case history* box.



Each type of event automatically recorded by BaseOps is listed. Selected the action that BaseOps should take when each event occurs. You have three choices.

- *never record* - BaseOps never records history events of this type.
- *always record* - Every time an event of this type occurs, BaseOps automatically adds a history event to the BaseOps case, recording details of the event.
- *record once per day at most* - Similar to *always record*. However, a maximum of one event per calendar day is recorded. If more than one event of this type occurs on a calendar day, earlier history events of the same type are deleted.

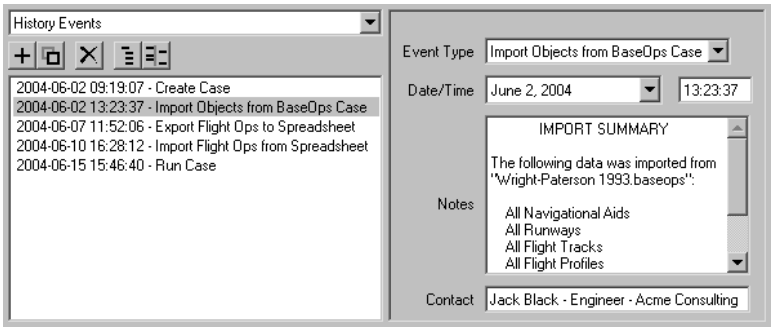
  Some history events may occur quite often. For example, you may run a case many times while editing it. In such situations, it is typically only that last event that is of historical interest. Therefore, BaseOps can be set to automatically discard such events that occurred earlier in the same day.

33.3. Manually Editing a Case's History

Automatic history event recording is optional. If desired, you can disable it and manually maintain a case's history. You can also choose a hybrid approach, automatically recording some events and manually recording others.

History events can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

To edit an event, first select it in the object list, then edit its properties in the text pane.



History events have the following properties.

- *Event Type* - Select one of the standard event types. Alternatively, select *User-Defined Event*, and type a short description of the event in the text box that appears.

- *Date/Time* - Select the date and time that the event occurred. The time should be entered using a 24-hour clock format, as in "14:25" for 2:25 PM.

- *Notes* - Miscellaneous information about the history event. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

- *Contact* - Type contact information for the person performing the history event. As a convenience, when an event is added, its initial contact information will be the name, position, and organization of the default contact information that is set on the Contact Information page of the Application Options dialog box.

Note:

If desired, you can edit or delete automatically-added history events just as you can manually-added ones.

Chapter 34

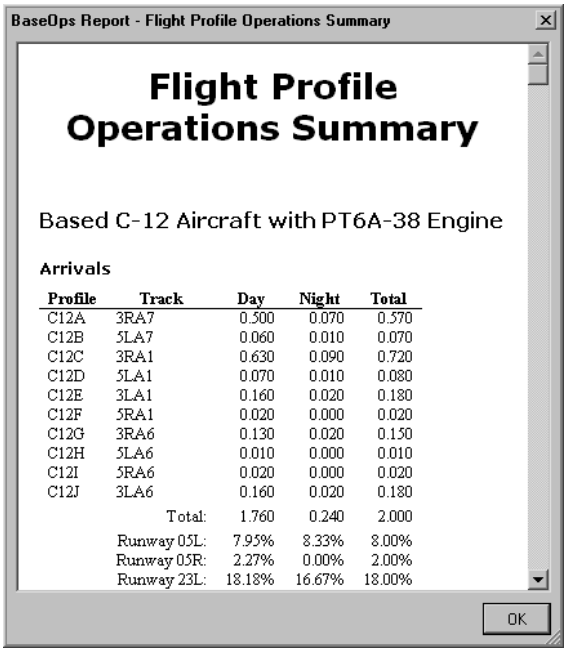
Creating Reports

BaseOps can create reports that contain most of the information in a BaseOps case. Reports are customizable — you have full control of the information that is presented, and can design your own specialty report (for example, a report showing only maps of F-16 flight profiles on runway 32).

To work with reports, choose Reports from the object type selector dropdown list. Reports can be added, duplicated, and deleted as described in *Chapter 5, Working with the List Pane*.

34.1. Viewing Reports

To view a report on the screen, select it in the object list, then press the View Report button on the text pane. The BaseOps Report dialog box appears.



See *Section B.13, Document Display Control*, for more information on the document display control used to display the report.

34.2. Printing Reports

To print a report, select it in the object list, then either:

- Press the Print button on the application toolbar
- Press Ctrl + P
- Choose Print from the File menu
- Press the Print Report button on the text pane

To print preview a report, either:

- Press the Print Preview button on the application toolbar
- Press Ctrl + W
- Choose Print Preview from the File menu
- Press the Print Preview Report button on the text pane

See *Chapter 35, Using Print Preview*, for more information on using print preview.

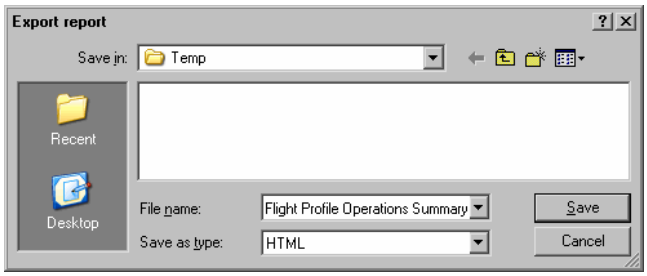
34.3. Exporting Reports

You can export reports to either HTML or text files. You can then import these files into a third-party application such as a word processor.

To export a report, select it in the object list, then either:

- Choose Export Report to File from the File menu
- Press the Export Report button on the text pane

The Export Report dialog box appears.



This is the standard Microsoft Windows Save File dialog box. The exact appearance of this dialog box will vary, depending on the version of Microsoft Windows that you are using. Familiarity with this dialog box is assumed.

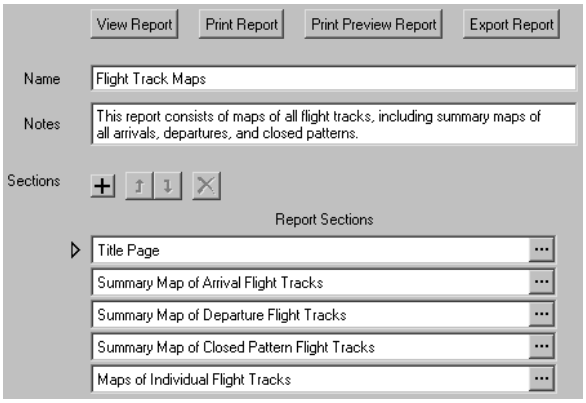
Choose the type of file you wish to export the report to: either HTML or Text. Then select the file name and press Save.

Note:

If your report contains a large number of maps, exporting it to HTML can take several minutes, since each map must be converted into a (potentially large) image file.

34.4. Customizing Reports

To customize a report, select it in the object list, then edit its properties in the text pane.



Reports have the following properties.

- *Name* - A descriptive name that uniquely and unambiguously identifies the report. There is no length restriction on the name.

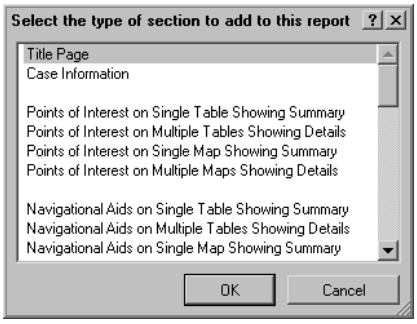
  The name appears on the report's title page.

- *Notes* - Miscellaneous information about the report. There is no restriction on the length of notes. Press the Enter key to insert additional lines.

- *Sections* - The sections that make up the report.

  Every report is comprised of one or more sections, which are roughly equivalent to chapters. You create a report by adding sections and editing their properties

  To add a new section, either press the Add Section button +, or press Ctrl + A. The Select Type of Section dialog box appears.



  Select the type of section you would like to add, then press OK. The section is added to the report.

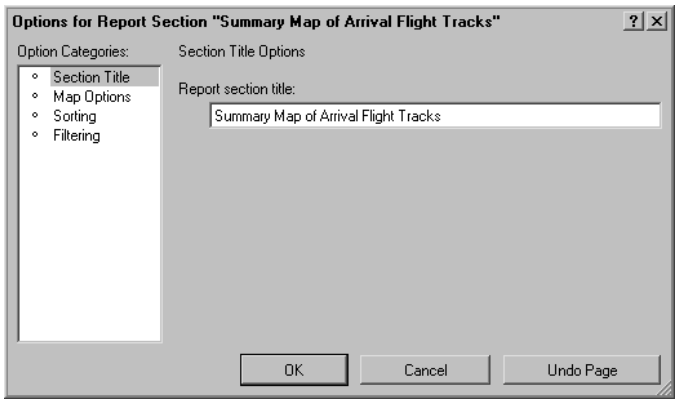
  To edit a section's properties, press the Edit button ... next to that section. A dialog box appears that allows you to edit the section's options. See *Section 34.5, Section Options Dialog Box*.

  To delete a section, either press the Delete Section button ×, or press Ctrl + Del.

  To move a section up or down in the table, press the Move Up and Move Down buttons ↑ and ↓, or press Ctrl + U and Ctrl + D. Sections appear in the report in the order they are listed.

34.5. Section Options Dialog Box

Use the Section Options dialog box to edit the properties of a report section.



The left portion of the dialog box displays a list of option categories. One category in this list is always selected. The right portion of the dialog box displays controls that allow you to change the options in the selected category.

The Section Options dialog box is a Multiple Page dialog box. See *Section B.2, Multiple Page Dialog Boxes*, for more information.

Note:

The available options will depend on the section type. Not all options are applicable to all types of sections.

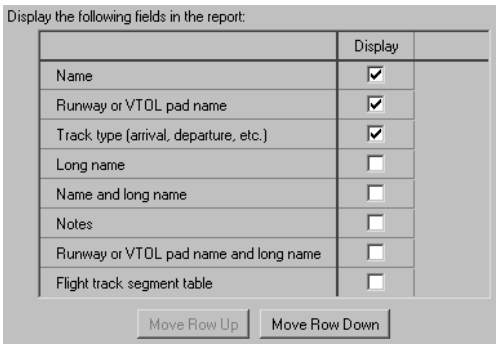
34.5.1. Section Title

Use the Section Title page of the Section Options dialog box to set the title of the section.

The title appears on the page that introduces the section in the report.

34.5.2. Fields

Use the Fields page of the Section Options dialog box to set the information that appears in report table(s).

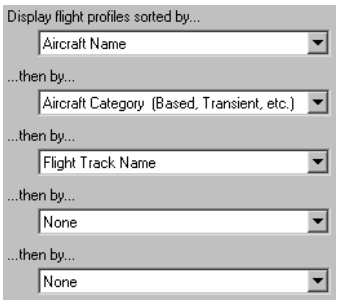


The Fields page appears only for table sections. For a summary table, each field represents one column in the table. For detail tables, each field represents one row in the tables. Check the box next to each field that you would like to appear in the table(s).

Use the Move Row Up and Move Row Down to set the order that the fields will appear in the table(s).

34.5.3. Sorting

Use the Sorting page of the Section Options dialog box to set the order in which objects appear in the report section.

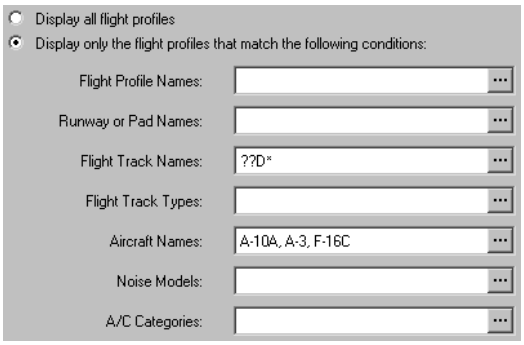


Use the drop-down lists to select the criteria for sorting. Objects will be sorted by the criteria you select, starting with the top criterion and working down the list. The available criteria will depend on the object type.

Once you have selected all of the desired criteria, set the remaining drop-down lists to "None".

34.5.4. Filtering

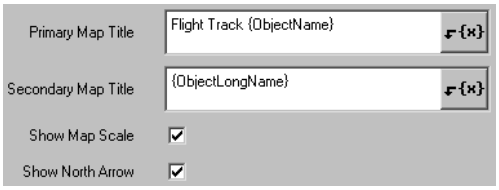
Use the Filtering page of the Section Options dialog box to control which objects appear in the report section.



Select the objects that will appear in the report. This is done in a similar manner to selecting the objects to display in the object list. See *Section 5.7, Filtering the Object List*, for more information.

34.5.5. Map Options

Use the Map Options page of the Section Options dialog box to control how map(s) appear in the report section. The Map Options page appears only for map sections.



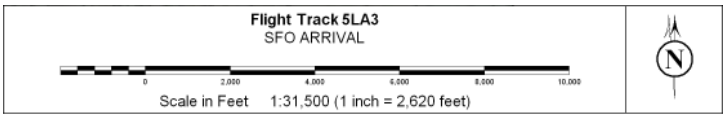
The *Primary Map Title* and *Secondary Map Title* appear in the legend area of the map(s). The primary title appears in a bolder font.

The titles can have as many lines as desired. Press the Enter key to insert a new line.

The titles can include *symbolic fields*, placeholders for text that is automatically inserted when the title is displayed. For example, the field {ObjectName} is automatically replaced with the name of the object being displayed by the map.

Press the Insert Symbolic Field button , located to the right of the text box, to display a list of fields from which you can choose. See *Section B.5, Symbolic Fields Text Control*, for more information about symbolic fields.

Check the *Show Map Scale* and *Show North Arrow* boxes to include a graphical map scale and a north arrow, respectively, in the legend area of the map(s). The north arrow shows both true and magnetic north.



Sample map legend that includes both a graphical map scale and a north arrow

Chapter 35

Using Print Preview

BaseOps's print preview capability lets you view the pages of a document before you print it. You can select paper orientation and margins, view 1, 2, 4, or more pages at a time, magnify individual pages for close inspection, and select individual pages to print.

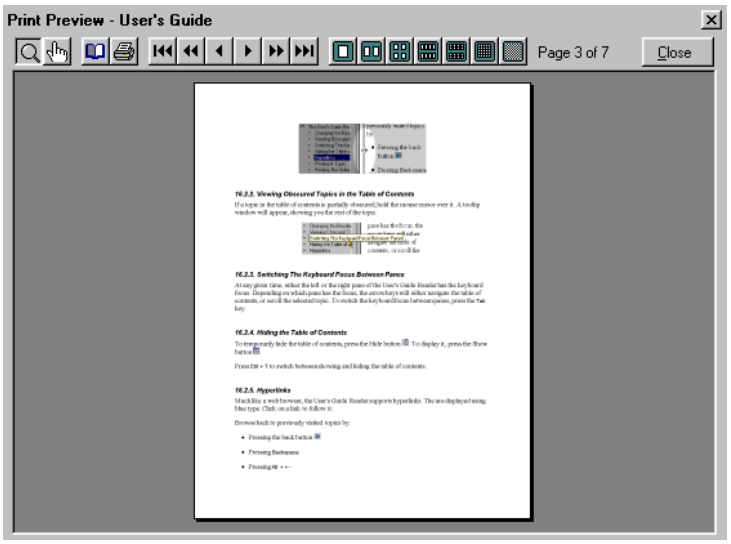
To print preview the selected report or objects (see *Chapter 5, Working with the List Pane*), either:

- Press the Print Preview button on the application toolbar
- Press Ctrl + W
- Choose Print Preview from the File menu

To print preview the BaseOps User's Guide, press the print preview button on the User's Guide reader toolbar. See *Chapter 38, Accessing Help*, for more information.

35.1. Print Preview Dialog Box

The Print Preview dialog box is used to print preview documents.



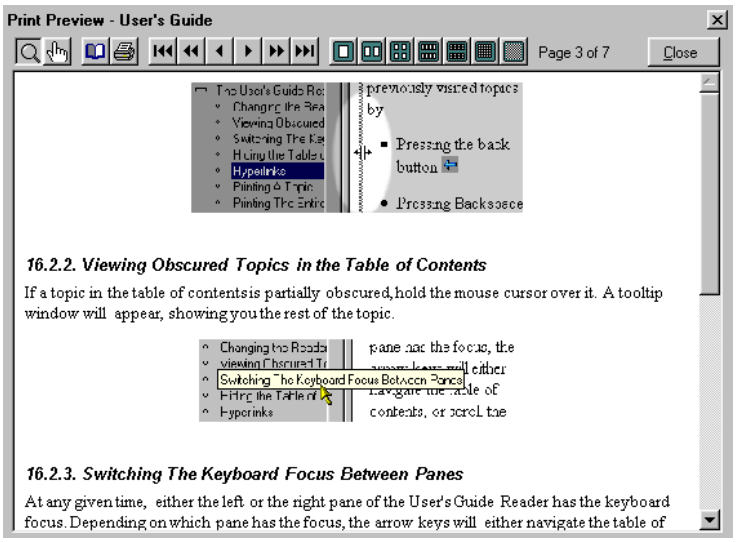
Use either the toolbar buttons or the keyboard to navigate through the pages.

Button	Key	Description
	→	Go forward to next page
	←	Go back to previous page
	Page Down	Go forward to next group of pages
	Page Up	Go back to previous group of pages
	End	Go to last page
	Home	Go to first page

35.2. Magnifying a Page

You can magnify a page to study it in detail. Follow these steps.

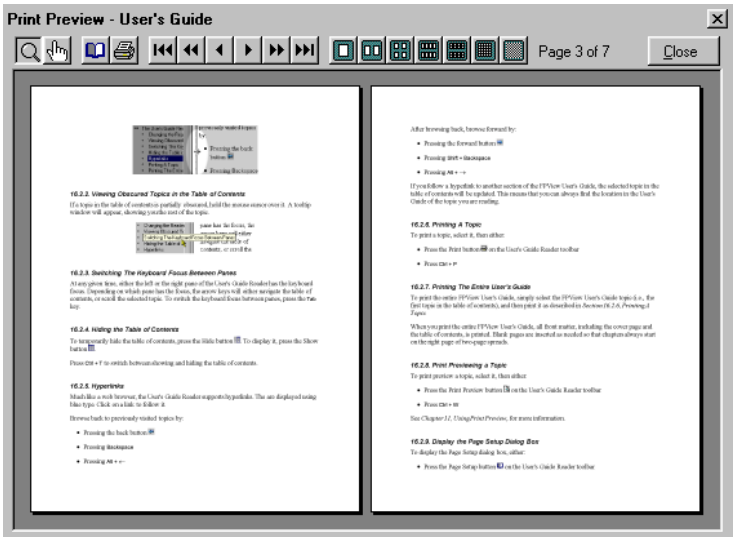
1. Press the Magnify toolbar button . This activates the Magnify Page tool.
2. Click on a page. The page is magnified so that it fills the print preview window.



3. Click on the page a second time to return it to its normal size. Alternatively, press the - key.

35.3. Displaying Multiple Pages at a Time

You can display 1, 2, 4, or more pages simultaneously.



Use either the toolbar buttons or the keyboard to change the number of pages simultaneously displayed.

Button	Key	Description
	Ctrl + 1	Show 1 page at a time
	Ctrl + 2	Show 2 page at a time
	Ctrl + 3	Show 4 page at a time
	Ctrl + 4	Show 8 page at a time
	Ctrl + 5	Show 16 page at a time
	Ctrl + 6	Show 32 page at a time
	Ctrl + 7	Show 64 page at a time

Press the + key to decrease the number of pages displayed simultaneously. Press the - key to increase the number of pages displayed simultaneously.

 *Note:*

The functions of the + and - keys may seem backwards to you. To help remember the meanings of these two keys, note that the + key makes each page bigger. Indeed, if you press the + key when only a single page is displayed, that page is magnified.

35.4. Printing All Pages

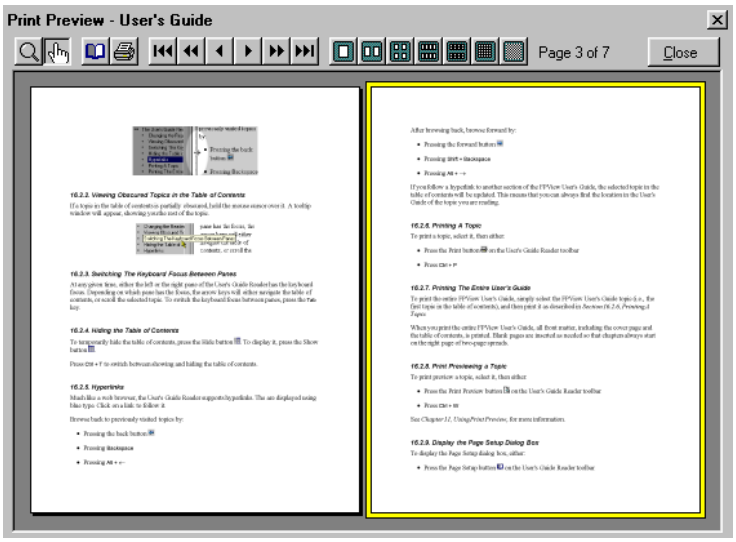
To print all pages from the print preview window, follow these steps.

1. Display the Print dialog box by either:
   - Pressing the Print button  on the print preview toolbar
   - Pressing Ctrl + P
2. In the Page Range section of the Print dialog box, choose All. Then press the OK button.

35.5. Selecting Pages to Print

To print a subset of the pages in the print preview window, follow these steps.

1. Press the Page Selection toolbar button  . This activates the Page Selection tool.
2. Click on the pages you want to print. A border will appear around the pages you select.



Click on a selected page a second time to deselect it.

To select a range of pages, click on the first page in the range, then Shift + click (i.e., click while holding down the Shift key) on the last page in the range.

To deselect a range of pages, click on the first page in the range, then Ctrl + click (i.e., click while holding down the Ctrl key) on the last page in the range.

3. Display the Print dialog box by either:

   - Pressing the Print button on the print preview toolbar
   - Pressing Ctrl + P

4. In the Page Range section of the Print dialog box, choose Selection. Then press the OK button.

35.6. Changing the Paper Margins and Orientation

Display the Page Setup dialog box by either:

- Pressing the Page Setup button on the print preview toolbar
- Pressing Ctrl + Shift + P

Microsoft Window's standard Page Setup dialog box lets you select the paper orientation (portrait or landscape) and page margins of your printer. The exact appearance of this dialog box will vary, depending on the version of Windows you are using. Familiarity with this dialog box is assumed.

35.7. Closing the Print Preview Dialog Box

To close the Print Preview dialog box, you can:

- Press the Close button
- Press the Esc key

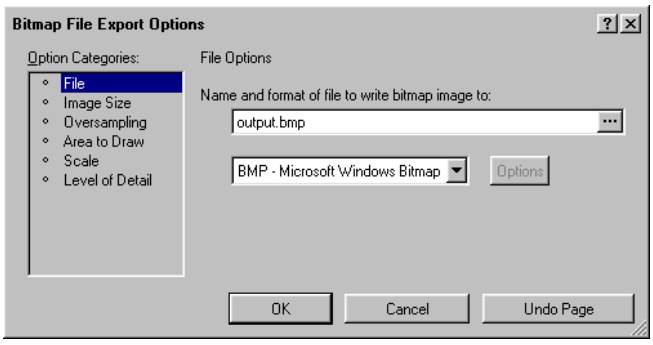
Chapter 36

Exporting Maps as Bitmap Images

Using BaseOps, you can create a bitmap image of a map. The image can be stored in a file or copied onto the clipboard. More than a mere screen capture, the image can be created at a high resolution (for example, 600 pixels per inch), resulting in a publication-quality image. For low-resolution maps that will be displayed on a computer monitor, you can use oversampling to improve the map's appearance.

36.1. Exporting a Map to a Bitmap Image File

To export a map to a bitmap image file, choose Export Map to Bitmap from the File menu. The Bitmap File Export Options dialog box appears.



The Bitmap File Export Options dialog box is a Multiple Page dialog box. See *Section B.2, Multiple Page Dialog Boxes*, for more information.

36.2. Copying a Map to the Clipboard

To copy a bitmap image of a map onto the clipboard, first ensure that the map has the keyboard focus by pressing Alt + M, then either choose Copy from the Edit menu, or press Ctrl + C. The Clipboard Copy Options dialog box appears. This dialog box is identical to the Bitmap File Export Options dialog box, with the exception that the page used to specify the destination file and format is not present.

In this chapter, only the Bitmap File Export Options dialog box will be discussed. Keep in mind, however, that the options described also apply when a map is copied to the clipboard.

36.3. Destination File Name and Format

Use the File page of the Bitmap File Export Options dialog box to set the name and format of the file where the bitmap image is written.

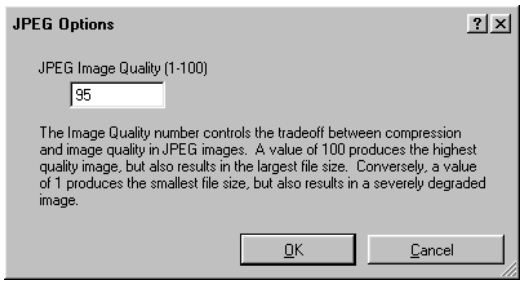
In the box provided, type the name of file where the bitmap image will be written. Press the Browse button ..., located to the right of the text box, to display the Open File dialog box, which allows you to browse for the file.

Select the image format of the file. You have the following choices.

- BMP - Microsoft Windows Bitmap Format
- GIF - GIF Format
- JPG - JPEG Format
- TIF - Tagged Image File Format (TIFF)
- PNG - Portable Network Graphics Format

36.3.1. JPEG Options

If you select the JPEG format, the Options button will be available. Press it to display the JPEG Options dialog box.



Type the image quality number, an integer between 1 and 100. The Image Quality number controls the tradeoff between compression and image quality in JPEG images. A value of 100 produces the highest quality image, but also results in the largest file size. Conversely, a value of 1 produces the smallest file size, but also results in a severely degraded image.

36.3.2. Selecting an Image Format

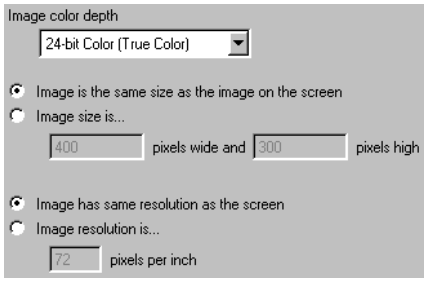
The JPEG format is intended for storing photographs. Most maps are line images, so one of the other image formats will usually be a better choice. However, if your map has areas of smoothly-changing color (for example, a map with an aerial photograph for the background), JPEG will be the best format.

Neither the BMP nor the TIFF formats are compressed, so they will produce large files. However, both are very common formats. The BMP format, in particular, is very well supported on the Microsoft Windows platform. If you intend to import your image into another program, the BMP format is an excellent choice.

If you intend to archive the image, or display it on the web, the PNG format is a good choice. It achieves high compression on most maps. It is a newer format than the others, but most applications (and in particular, most web browsers) now support it.

36.4. Image Size

Use the Image Size page of the Bitmap File Export Options dialog box to select the size, resolution, and color depth of the bitmap image you will export your map to.



36.4.1. Image Color Depth

Select the color depth of the bitmap image. This is the maximum number of colors in the bitmap. You have the following choices.

- *24-bit Color (True Color)* - Each pixel in the bitmap requires 24 bits (3 bytes) of memory. The bitmap can display over 16,000,000 colors.
- *8-bit Color, Optimized Palette* - Each pixel in the bitmap requires 8 bits (1 byte) of memory. The bitmap can display 256 colors. The 256 colors are selected so that they best represent the colors in your map. This color depth requires one-third the memory of 24-bit color. Many maps can be reduced to 256 colors with little loss in quality.
- *8-bit Color, Web Palette* - Each pixel in the bitmap requires 8 bits (1 byte) of memory. The bitmap can display 256 colors. The 256 colors are those that all web browsers can display without dithering. This color depth requires one-third the memory of 24-bit color, but the image quality can be poor unless you carefully select the colors in your map.
- *8-bit Grayscale* - Each pixel in the bitmap requires 8 bits (1 byte) of memory. The bitmap can display 256 shades of gray. This color format is useful if the bitmap will be printed on black-and-white laser printers.

36.4.2. Image Size

Select the method used to specify the dimensions of the bitmap image (i.e., the width and height of the bitmap, in pixels) that your map will be exported to. You have two choices.

- *Image is the same size as the image on the screen* - The bitmap image has the same dimensions (in pixels) as the portion of the screen currently used to display the map.
- *Image size is* - Type the width and height of the bitmap image, in pixels.

Caution:

Your computer's memory limits the maximum size and color depth of an export bitmap image. If your computer takes an exceptionally long time to export a map to a bitmap, you may not have enough memory. This is especially true if your hard drive light stays on constantly while creating the image. Try reducing the image's size and/or color depth.

The image's resolution does not affect the amount of memory used.

36.4.3. Image Resolution

The resolution of a bitmap measures the size of the pixels. It is typically expressed in pixels per inch or pixels per centimeter.

As an example, assume that your map has features that are drawn with 1-millimeter-wide lines. If you export this map to a bitmap image with a resolution of 100 pixels per centimeter, these lines will be 10 pixels wide.

Computer monitors typically have a resolution of 70 to 90 pixels per inch. Laser printers typically have a resolution of 600 to 1200 pixels per inch.

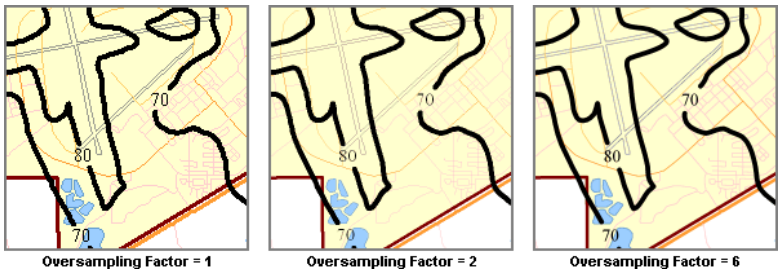
Select the method used to specify the image resolution. You have two choices.

- *Image has same resolution as the screen*
- *Image resolution is* - Type the resolution, in pixels per inch.

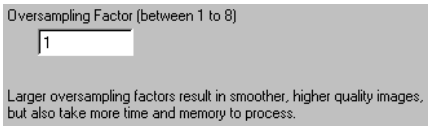
36.5. Oversampling

BaseOps can use oversampling to improve the appearance of low-resolution maps. Oversampling reduces jagged edges. In technical terms, it antialiases your entire map.

The amount of oversampling is controlled by the *oversampling factor*, an integer between one and eight. An oversampling factor of one means that oversampling is not performed. Higher factors result in smoother, higher-quality images, but also dramatically increase the amount of memory required to export a map.



Use the Oversampling page of the Bitmap File Export Options dialog box to set the oversampling factor used when exporting a map to a bitmap image.



Type the oversampling factor in the box provided.

When using oversampling, you should choose 24-bit true color or 8-bit grayscale color for your image. See *Section 36.4.1, Image Color Depth*.

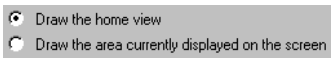
Caution:

Oversampling dramatically increases the amount of memory needed to export a map to a bitmap image. The amount of memory required is proportional to the square of the oversampling factor.

Until you gain familiarity with your computer's capabilities, it is recommended that you initially export your map with a low oversampling factor, and then attempt to export it with gradually increasing factors. If your computer takes an exceptionally long time to export a map, you may not have enough memory. This is especially true if your hard drive light stays on constantly while exporting. Try reducing the oversampling factor.

36.6. Area to Draw

Use the Area To Draw page of the Bitmap File Export Options dialog box to select the portion of your map that is drawn on the exported bitmap image.



Select the area to draw. You have two choices.

- *Draw the home view* - The home view of the map is drawn. See *Section 6.6, The Home View*, for more information about the home view.
- *Draw the area currently displayed on the screen* - The portion of the map currently displayed on your computer's monitor is drawn. If you want to export only a small portion of your map, zoom in on that section, then export the map, choosing to draw the area currently displayed on the screen.

Note:

If the Area to Draw is not the same shape as the export bitmap image (i.e., if the aspect ratios are different), the area drawn will be larger that the area requested.

Note:

If you export a map to scale, BaseOps attempts to display the Area To Draw at the requested scale. If the requested scale is too large, this area will not fit on the bitmap image. In this case, you have four options: 1) choose a smaller scale, 2) choose a smaller Area To Draw, 3) increase the size of the bitmap image, or 4) decrease the resolution of the bitmap image.

36.7. Scale

Use the Scale page of the Bitmap File Export Options dialog box to set the scale at which your map is drawn on the export bitmap image.

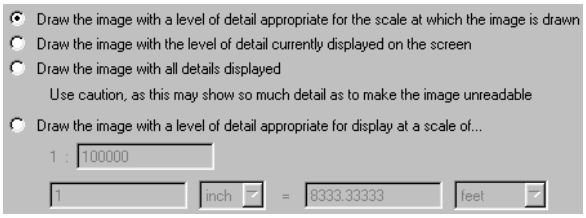
Select how the scale is determined.

- *Automatically select the scale at which the image is drawn* - BaseOps selects a scale so that the map's area of interest just fills the export bitmap image. The area of interest is specified on the Area To Draw page. See *Section 36.6, Area to Draw*.

- *Draw the image at a scale of* - Specify the scale at which the map is drawn on the export bitmap image.

36.8. Level of Detail

Use the Level Of Detail page of the Bitmap File Export Options dialog box to control how much background map detail is displayed when you export your map as a bitmap image.



Many background maps specify a minimum scale at which various features should be displayed. As you zoom in on such a map, additional detail is displayed. The intent is to prevent excessive

detail from cluttering a map when it is displayed at a small scale. See *Chapter 9, Background Map Formats*.

Use the Level of Detail page to control how BaseOps uses this recommended scale information when you export your map as a bitmap image. You have four choices for how BaseOps determines how much detail to display.

- *Draw the image with a level of detail appropriate for the scale at which the image is drawn* - Any recommended scale information in the background map is used.
- *Draw the image with the level of detail currently displayed on the screen* - The level of detail is the same as that currently displayed by the map on your computer's monitor.
- *Draw the image with all details displayed* - Any recommended scale information in the background map is ignored.

  Caution:

  This may display so much background map detail as to make the exported image illegible.

- *Draw the image with a level of detail appropriate for display at a scale of* - The level of detail is the same as if the map was being exported at a scale you specify.

Chapter 37

Geographic Coordinate Systems

The location of a point on the Earth's surface can be numerically described in a number of ways. Examples include:

- the longitude and latitude of the point (100.5° west, 45.3° north)
- the location with respect to another known point (500 feet northwest of the Empire State Building)
- the Universal Transverse Mercator coordinates of the point (715,326.1 meters east, 5,037,295.1 meters north, UTM zone 15)

Each of these methods of describing a location is known as a *geographic coordinate system*. When working with maps, the term *projection* is also commonly used. While there are technical differences, for most practical purposes, you can consider the terms "coordinate system" and "projection" as synonymous.

BaseOps allows you to use a number of common coordinate systems when working with geographic data. The supported coordinate systems are:

- Albers Conical Equal Area
- Azimuthal Equidistant
- Equirectangular
- Lambert Azimuthal Equal Area
- Lambert Conformal Conic
- Local Flat-Earth X-Y
- Longitude and Latitude

- Orthographic
- Stereographic
- Universal Transverse Mercator (UTM)
- Web Mercator

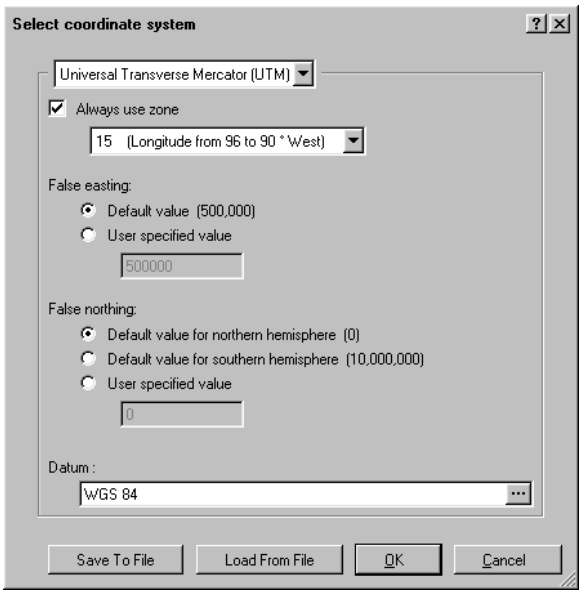
For additional information about coordinate systems, the following references are recommended.

- *An Album of Map Projections*, U.S. Geological Survey Professional Paper 1453, by John P. Snyder and Philip M. Voxland, United States Government Printing Office, 1989.
- *Map Projections—A Working Manual*, U.S. Geological Survey Professional Paper 1395, by John P. Snyder, United States Government Printing Office, 1987.

37.1. Coordinate System Control

A Coordinate System Control is used to select a geographic coordinate system.

The current coordinate system is displayed in the box. To change it, either press the Space Bar, or press the Select Coordinate System button ... The Select Coordinate System dialog box is displayed.



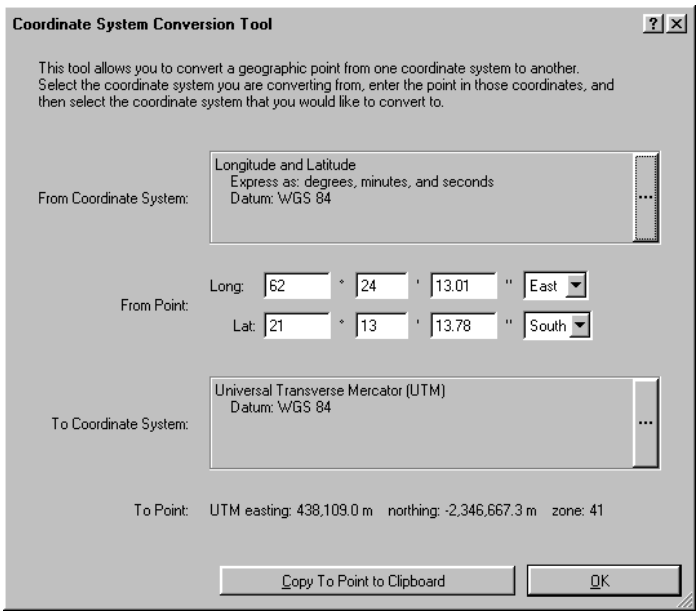
Use the drop-down list at the top of the outlined area to select the coordinate system. Then supply values for the selected system's parameters.

Some coordinate systems have numerous parameters, which can be tedious to enter. Therefore, BaseOps allows you to save coordinate systems to files for later reuse. Press the Save To File button to save the current coordinate system to a file. Press the Load From File button load a previously saved coordinate system.

37.2. Coordinate System Conversion Tool

The coordinate system conversion tool allows you to convert a point's coordinates from one geographic coordinate system to another. To use the tool, follow these steps.

1. Choose Coordinate System Conversion Tool from the Tools menu. The Coordinate System Conversion Tool dialog box appears.



2. *From Coordinate System* - Select the geographic coordinate system that you are converting from. See *Section 37.1, Coordinate System Control*, for information on selecting a coordinate system.

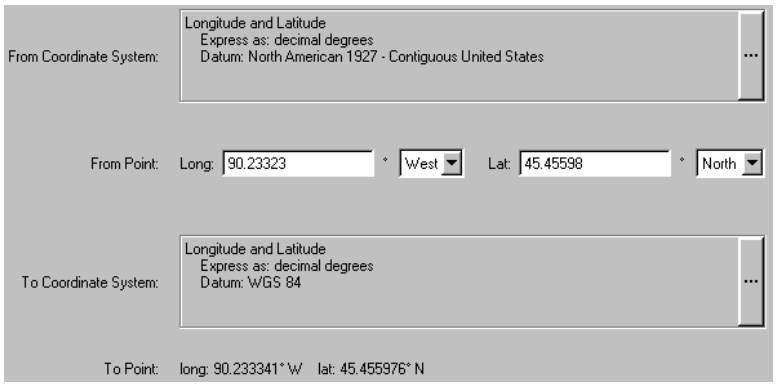
3. *From Point* - Specify the geographic coordinates of the point in the coordinate system you are converting from. The controls available for entering the point will vary, depending on the From coordinate system.

4. *To Coordinate System* - Select the geographic coordinate system that you are converting to. See *Section 37.1, Coordinate System Control*, for information on selecting a coordinate system.

5. *To Point* - The geographic coordinates of the point, expressed in the To coordinate system, are displayed. Press the "Copy To Point to Clipboard" button to put this text onto the clipboard.

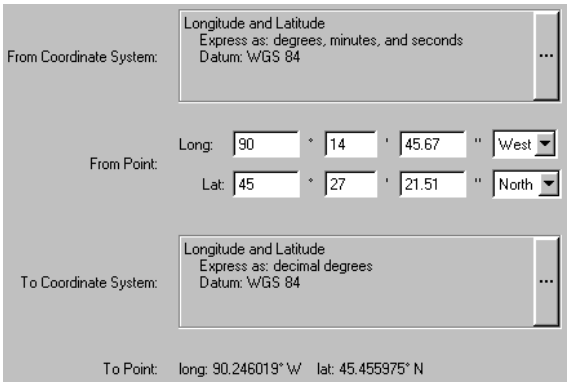
Tip:

You can use the coordinate system conversion tool to convert between datums. Choose "Longitude and Latitude" for both the From and To coordinate systems. Set the datums of the From and To coordinate systems to your From and To datums, respectively.



Tip:

You can use the coordinate system conversion tool to convert a longitude and latitude from decimal degrees to degrees, minutes, and seconds, or vice versa. Make sure that you use the same datum for both the From and To coordinate systems.

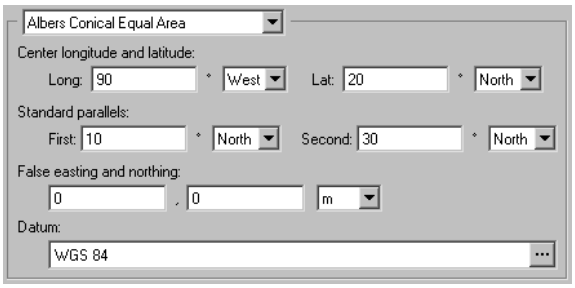


37.3. Albers Conical Equal Area

37.3.1. Description

The Albers Conical Equal Area coordinate system is equal-area, meaning that the areas of all regions are shown in the same proportion to their true areas. It is commonly used for maps of the contiguous United States, and is recommended for equal-area maps that are predominantly east-west in extent.

37.3.2. Parameters



- *Center longitude and latitude* - Type the center longitude and latitude. To minimize distortion, the center latitude should be near the center of your area of interest.
- *Standard parallels* - Type the first and second standard parallels. Typically, these will be near the southern and northern borders of your area of interest.

Important:

The standard parallels cannot be symmetrical spaced on opposite sides of the equator. For example, standard parallels of 30° south and 30° north are illegal.

- *False easting and northing* - Type the false easting and northing, and select the units used to express them. Locations in this coordinate system are expressed using these units.
- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

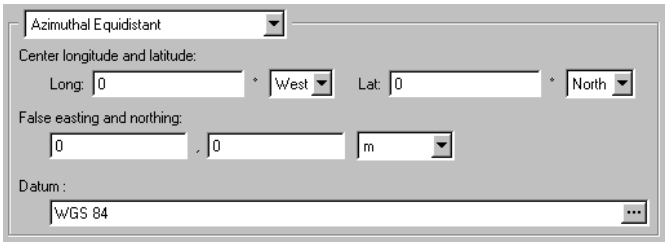
37.4. Azimuthal Equidistant

37.4.1. Description

The Azimuthal Equidistant coordinate system is used to visualize the distance and direction of various features as seen from a given point of interest (denoted by the center longitude and latitude).

The United Nations' emblem is based upon an azimuthal equidistant map with a center latitude of 90 degrees north.

37.4.2. Parameters



- *Center longitude and latitude* - Type the center longitude and latitude. To minimize error, the center longitude and latitude should be near the center of your point of interest.
- *False easting and northing* - Type the false easting and northing, and select the units used to express them. Locations in this coordinate system are expressed using these units.
- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

37.5. Equirectangular

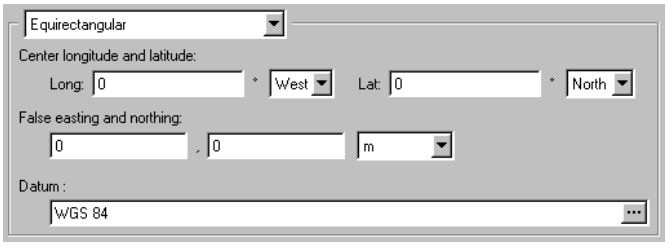
37.5.1. Description

The Equirectangular coordinate system is essentially a direct scaling of longitudes and latitudes to distances east and north, with the scaling selected such that distortion is minimized along the central latitude parallel. Distortion increases with distance from the central latitude: this increase becomes quite rapid near the poles.

The Equirectangular coordinate system is most useful for maps of regions that are predominantly east-west in extent. The Equirectangular coordinate system is often used to map bands that encircle the Earth and are enclosed by two fairly close parallels of latitude: for example, the region between latitudes 20° north and 30° north. It is also used in situations where ease of mapping is paramount.

This coordinate system is also know by the names Equidistant Cylindrical, Rectangular, and La Carte Parallelogrammatique.

37.5.2. Parameters



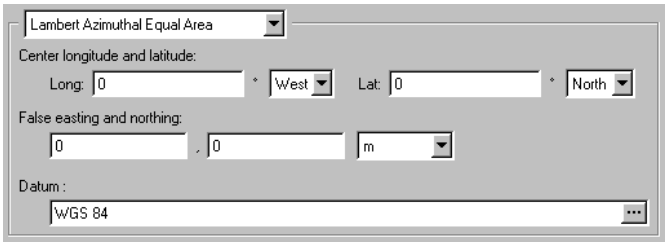
- *Center longitude and latitude* - Type the center longitude and latitude. To minimize distortion, the center latitude should be near the center of your area of interest.
- *False easting and northing* - Type the false easting and northing, and select the units used to express them. Locations in this coordinate system are expressed using these units.
- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

37.6. Lambert Azimuthal Equal Area

37.6.1. Description

The Lambert Azimuthal Equal Area coordinate system is commonly used for large-scale maps of regions that are predominantly east-west in extent. This is an equal-area coordinate system, meaning that the areas of all regions are shown in the same proportion to their true areas.

37.6.2. Parameters



- *Center longitude and latitude* - Type the center longitude and latitude. To minimize distortion, the center longitude and latitude should be near the center of your area of interest.

- *Standard parallels* - Type the first and second standard parallels. Typically, these will be near the southern and northern borders of your area of interest.

Important:

The standard parallels cannot be symmetrical spaced on opposite sides of the equator. For example, standard parallels of 30° south and 30° north are illegal.

- *False easting and northing* - Type the false easting and northing, and select the units used to express them. Locations in this coordinate system are expressed using these units.

- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

37.7. Lambert Conformal Conic

37.7.1. Description

The Lambert Conformal Conic coordinate system is commonly used for large-scale maps of regions that are predominantly east-west in extent.

This coordinate system is also know by the name Conical Orthomorphic.

37.7.2. Parameters

- *Center longitude and latitude* - Type the center longitude and latitude. To minimize distortion, the center latitude should be near the center of your area of interest.

- *Standard parallels* - Type the first and second standard parallels. Typically, these will be near the southern and northern borders of your area of interest.

Important:

The standard parallels cannot be symmetrical spaced on opposite sides of the equator. For example, standard parallels of 30° south and 30° north are illegal.

- *False easting and northing* - Type the false easting and northing, and select the units used to express them. Locations in this coordinate system are expressed using these units.

- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

37.8. Local Flat-Earth XY

37.8.1. Description

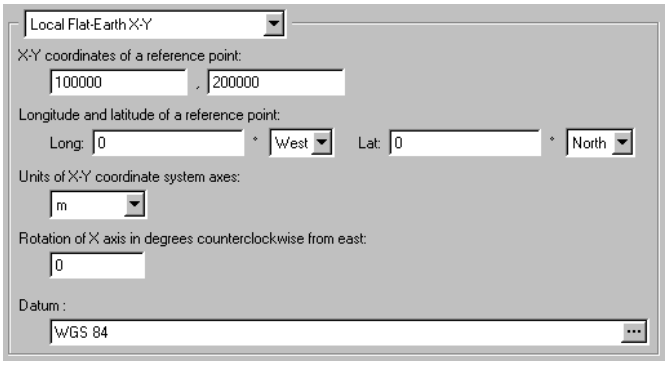
In the Local Flat-Earth XY coordinate system, locations are specified using a local Cartesian coordinate system: for example, meters east and north of a reference point. To specify this coordinate system, you must know both the X-Y and Longitude-Latitude coordinates of a reference point.

To minimize distortion, you should select a reference point near the center of your area of interest.

The Local Flat-Earth XY coordinate system is good general-purpose projection for maps of fairly small regions (tens of miles across) that have roughly the same east-west and north-south extent.

Technically, this projection is based upon a conical projection developed by the US Federal Aviation Administration for use by their Integrated Noise Model (INM). It is documented in an appendix of the INM User's Guide.

37.8.2. Parameters



- *X-Y coordinates of a reference point* - Specify the (X, Y) coordinates of the reference point.
- *Longitude and Latitude of a reference point* - Specify the longitude and latitude of the reference point, in decimal degrees.
- *Units of the XY coordinate system axes* - Select the units used to measure distances along the X-Y coordinate system axes.
- *Rotation of X axis in degrees counterclockwise from east* - Typically, projections measure distances east and north from a reference point. However, rotated projections are also possible. Specify the direction that the X axis points, in degrees counterclockwise from east.
- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

As an example, assume a Local Flat-Earth XY coordinate system is defined as follows.

- Reference Point, X-Y: 100, 200
- Reference Point, Longitude and Latitude: 90° west, 45° north
- Units of XY Axes: feet
- Rotation of X Axis: 45°

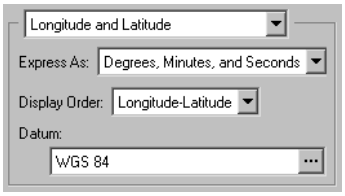
In this example coordinate system, the point (110, 200) would be located 10 feet northeast of longitude 90° west, latitude 45° north.

37.9. Longitude and Latitude

37.9.1. Description

Longitude and Latitude is the most common and well-known geographic coordinate system. Locations are specified in degrees of east longitude and north latitude.

37.9.2. Parameters



- *Express as* - Select how the longitude and latitude should be presented. You have three choices.
  - Decimal Degrees (for example, 85.175000°)
  - Degrees, Minutes, and Seconds (for example, 85° 10' 30.00")
  - Degrees and Decimal Minutes (for example, 85° 10.5000')

  ☞ ***Note:***

  In some situations, the *Express as* choice will not be available.

- *Display Order* - Select the order in which longitude and latitude are presented. You have two choices.
  - Longitude-Latitude (long: 85.175° W lat: 35.675° N)
  - Latitude-Longitude (lat: 35.675° N long: 85.175° W)

  ☞ ***Note:***

  In some situations, the *Display Order* choice will not be available.

- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

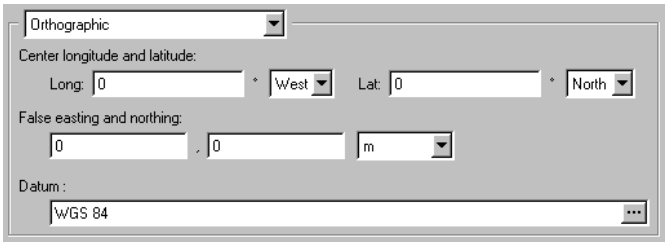
37.10. Orthographic

37.10.1. Description

The Orthographic coordinate system is most often used to display an entire hemisphere. Such a map will appear similar to the Earth as seen from a spacecraft located directly above the center longitude and latitude.

When the center latitude is 90 south or 90 north, this projection is also used to display the polar regions of the Earth.

37.10.2. Parameters



- *Center longitude and latitude* - Type the center longitude and latitude. To minimize distortion, the center longitude and latitude should be near the center of your area of interest.
- *False easting and northing* - Type the false easting and northing, and select the units used to express them. Locations in this coordinate system are expressed using these units.
- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

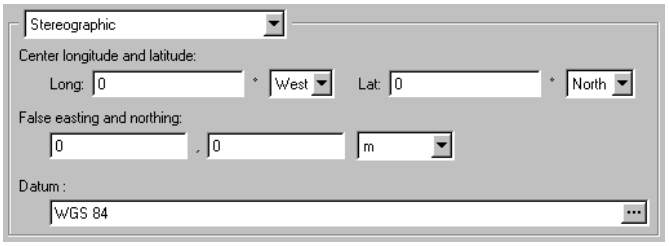
37.11. Stereographic

37.11.1. Description

The Stereographic coordinate system is commonly used for both small- and large-scale maps (showing one hemisphere or less) of regions that are roughly circular in extent.

When the center latitude is 90 south or 90 north, this projection is also used to display the polar regions of the Earth.

37.11.2. Parameters



- *Center longitude and latitude* - Type the center longitude and latitude. To minimize distortion, the center longitude and latitude should be near the center of your area of interest.

- *False easting and northing* - Type the false easting and northing, and select the units used to express them. Locations in this coordinate system are expressed using these units.

- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

37.12. Universal Transverse Mercator (UTM)

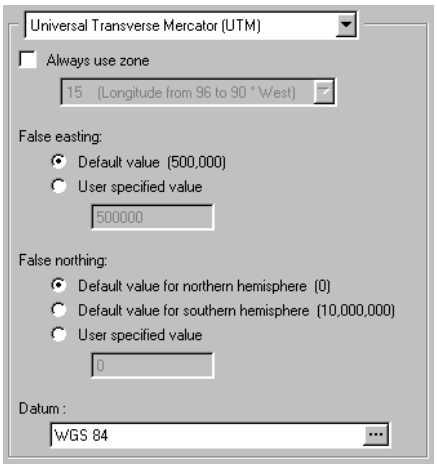
37.12.1. Description

Universal Transverse Mercator, or UTM, is a common coordinate system that specifies locations in meters east and north from a reference point.

The UTM system divides the globe into 60 *zones*, each 6 degrees of longitude wide and stretching from 80 degrees south latitude to 80 degrees north latitude.

UTM is suitable for mapping regions that are contained entirely within a single zone and its two adjacent zones. Beyond this, distortion increases rapidly.

37.12.2. Parameters



- *Always use zone* - If you check this box, select the UTM zone number that will always be assumed. If you do not check this box, you will be asked for the zone whenever you enter coordinates.

  ☞ ***Note:***

  In some situations, you will be required to specify the UTM zone number.

- *False easting* - Select the false easting. Typically, this is 500,000, but in rare situations, a different value may be used. Unless you know otherwise, use the default of 500,000.

- *False northing* - Select the false northing. This is usually 0 in the northern hemisphere. In the southern hemisphere, 10,000,000 is often used. Unless you know otherwise, use the recommended default of 0 or 10,000,000, depending on your hemisphere.

- *Datum* - Select the coordinate system's datum. See *Section B.14, Datum Control*, and *Appendix E, Introduction to Datums*, for information on selecting datums.

37.13. Web Mercator

37.13.1. Description

The Web Mercator coordinate system is based upon the projection used by most web-based mapping services, including Google Maps, Bing Maps, MapQuest, and OpenStreetMap.

It is similar to the Mercator projection, but assumes a spherical earth for computational efficiency. As such, it has been criticized by some members of the cartography community as poorly conceived. However, there is no doubt as to its utility as a projection which a) is efficient, and b) can represent the entire globe (apart from the poles) as a seamless whole.

When displaying maps of the entire earth, Web Mercator does distort distances and areas, making the polar regions appear too large relative to areas near the equator. The distortion is minimal, however, when displaying maps of country-sized and smaller areas in the low- and mid-latitudes.

Web Mercator is used when overlaying data upon a raster map created by one of the web-based mapping services.

37.13.2. Parameters

While the false easting, false northing, and datum can be modified, it would be unusual that you would need to do so. Typically, Web Mercator is used with the default parameters of (0, 0) for the false easting and northing, and WGS 84 for the datum. These are the parameters used by all of the web-based mapping services.

Chapter 38

Accessing Help

38.1. Displaying the User's Guide Table of Contents

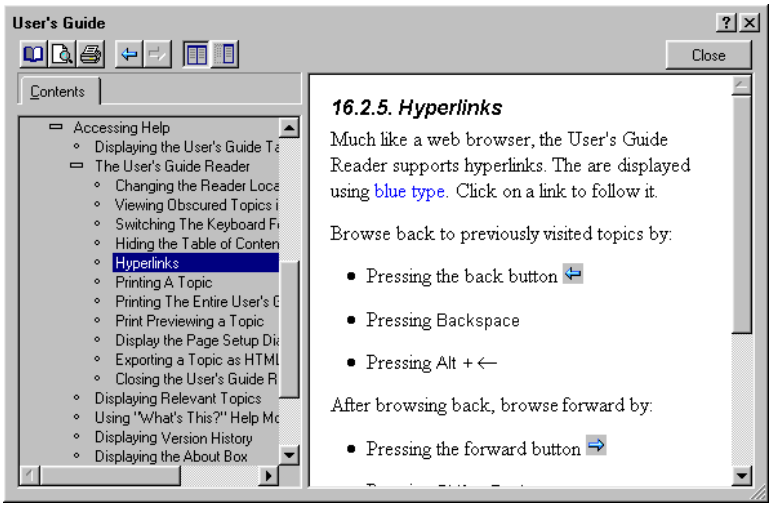
The entire BaseOps User's Guide (this document) can be browsed online. To display the table of contents, either:

- Press Ctrl + F1.
- Choose Contents from the Help menu.

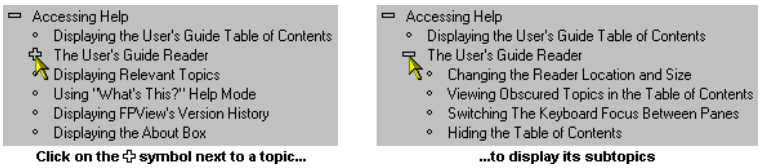
The User's Guide Reader will be displayed, showing the table of contents.

38.2. The User's Guide Reader

Use the User's Guide Reader to browse the User's Guide online.



The left side of the Reader displays the table of contents. One topic is always highlighted. It is referred to as the *selected topic*. To select a topic, click on it. Click on a plus symbol ✣ in the table of contents to display subtopics.

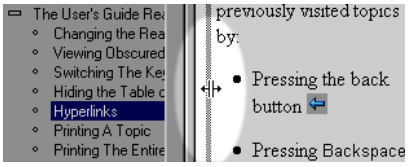


The right side of the Reader displays the selected topic using a document display control. See *Section B.13, Document Display Control*, for more information.

38.2.1. Changing the Reader Location and Size

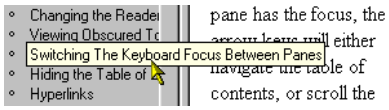
The User's Guide Reader window can be moved and resized as necessary. Drag its title bar to move it. Drag one of its edges to resize it.

To change the relative sizes of the two panes in the Reader, use the mouse to drag the separator between the two panes either left or right.



38.2.2. Viewing Obscured Topics in the Table of Contents

If a topic in the table of contents is partially obscured, hold the mouse cursor over it. A tooltip window will appear, showing you the rest of the topic.



38.2.3. Switching The Keyboard Focus Between Panes

At any given time, either the left or the right pane of the User's Guide Reader has the keyboard focus. Depending on which pane has the focus, the arrow keys will either navigate the table of contents, or scroll the selected topic. To switch the keyboard focus between panes, press the Tab key.

38.2.4. Hiding the Table of Contents

To temporarily hide the table of contents, press the Hide button . To display it, press the Show button .

Press Ctrl + T to switch between showing and hiding the table of contents.

38.2.5. Hyperlinks

Much like a web browser, the User's Guide Reader supports hyperlinks. The are displayed using blue type. Click on a link to follow it.

Browse back to previously visited topics by:

- Pressing the back button
- Pressing Backspace
- Pressing Ctrl + B

After browsing back, browse forward by:

- Pressing the forward button
- Pressing Shift + Backspace
- Pressing Ctrl + Shift + B

If you follow a hyperlink to another section of the BaseOps User's Guide, the selected topic in the table of contents will be updated. This means that you can always find the location in the User's Guide of the topic you are reading.

38.2.6. Printing A Topic

To print a topic, select it, then either:

- Press the Print button on the User's Guide Reader toolbar
- Press Ctrl + P

38.2.7. Printing The Entire User's Guide

To print the entire BaseOps User's Guide, simply select the BaseOps User's Guide topic (i.e., the first topic in the table of contents), and then print it as described in *Section 38.2.6, Printing A Topic*.

When you print the entire BaseOps User's Guide, all front matter, including the cover page and the table of contents, is printed. Blank pages are inserted as needed so that chapters always start on the right page of two-page spreads.

38.2.8. Print Previewing a Topic

To print preview a topic, select it, then either:

- Press the Print Preview button on the User's Guide Reader toolbar
- Press Ctrl + W

See *Chapter 35, Using Print Preview*, for more information.

38.2.9. Display the Page Setup Dialog Box

To display the Page Setup dialog box, either:

- Press the Page Setup button on the User's Guide Reader toolbar
- Press Ctrl + Shift + P

The Page Setup dialog box lets you select a printer, set the paper orientation (portrait or landscape), and set the page margins.

38.2.10. Exporting a Topic as HTML

To export a topic as HTML, select the topic, then press Ctrl + H. You will be prompted for the name of the HTML file that the topic will be written to.

38.2.11. Closing the User's Guide Reader

To close the User's Guide Reader, you can:

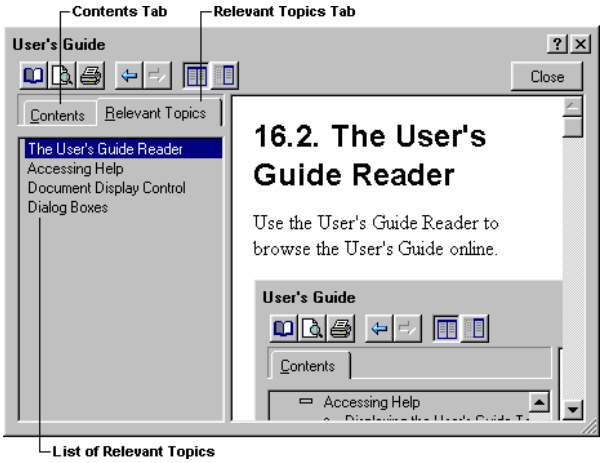
- Press the Close button

- Press the Esc key

38.3. Displaying Relevant Topics

Context-sensitive help, meaning help that is relevant to your current activity, can be displayed in BaseOps by:

- Pressing the F1 key
- Selecting Relevant Topics from the Help menu



BaseOps displays the User's Guide Reader, with a list of relevant topics listed in the left pane. The topics are ordered, with the most relevant at the top of the list.

To display the table of contents, click on the Contents tab, or press Alt + C.

To display the list of relevant topics, click on the Relevant Topics tab, or press Alt + R.

38.4. Using "What's This?" Help Mode

BaseOps's "What's This?" help mode lets you click on an object in BaseOps and have the relevant section of the User's Guide displayed. To enter "What's This?" help mode, you can:

- Press Shift + F1
- Choose What's This? from the Help menu

- Press the "What's This?" button ? on the title bar of a dialog box

BaseOps enters "What's This?" help mode, and the mouse cursor changes to a question mark  . Click anywhere on the BaseOps application. The BaseOps User's Guide is displayed with a list of topics relevant to the location where you clicked.

If you accidentally enter "What's This?" help mode, cancel it by pressing the Esc key.

38.5. Displaying BaseOps's Version History

To display the version history of BaseOps, choose Show Version History from the Help menu. The version number and new feature summary of all BaseOps versions is displayed.

38.6. Displaying the About Box

To display the BaseOps about box, choose About from the Help menu. The about box shows important information about the BaseOps application, including:

- The version
- The build number
- The list of sponsors
- Developer contact information

If you need to know the version of BaseOps you are running, check the about box.

Appendix A

Sponsors

The development of BaseOps was funded by the following agencies.

- Naval Facilities Engineering Command (NAVFACENGCOM)
  Washington Navy Yard, Washington, DC
- Human Systems Center (AFMC)
  Brooks Air Force Base, Texas

Appendix

Details of Various BaseOps Components

B

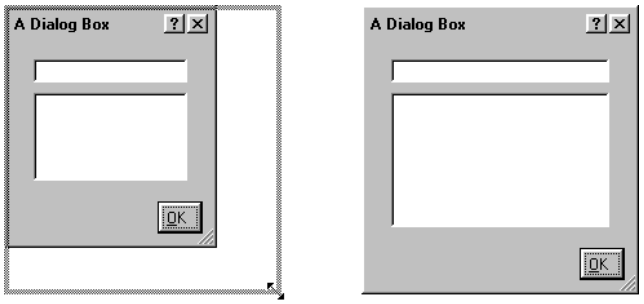
BaseOps uses a number of specialized components. Some of these components (for example, the coordinate system control) are specific to BaseOps, and are described in detail. Other components (for example, the text edit control) are commonly used by Microsoft Windows applications. Familiarity with these common components is assumed: only unique or non-obvious aspects are described in this appendix.

B.1. Dialog Boxes

Most BaseOps dialog boxes can be moved and resized. BaseOps remembers the new position and size, and uses them the next time that dialog box is displayed.

To move a dialog box to a new location, drag it by its title bar.

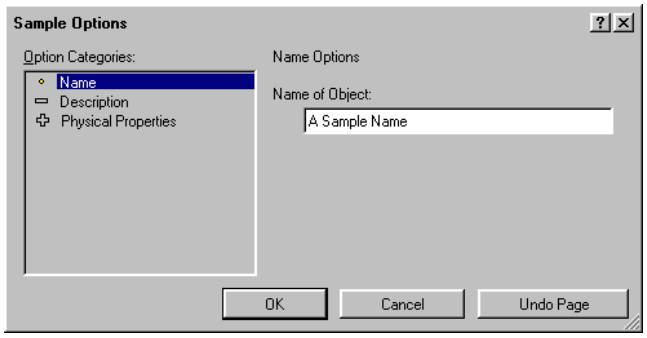
To resize a dialog box, drag one of its edges. The layout of the dialog box's contents will be updated to fit the new size.



Press Tab and Shift + Tab to move the keyboard focus between controls in a dialog box.

B.2. Multiple Page Dialog Boxes

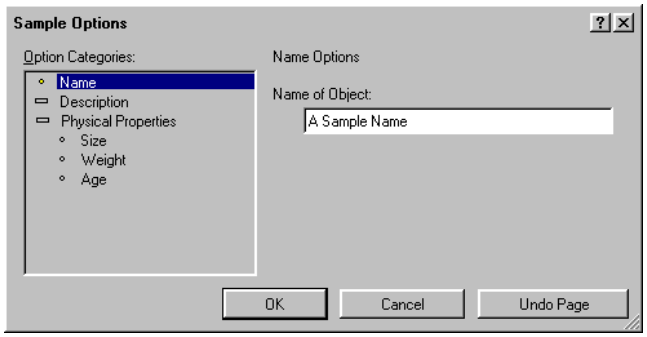
BaseOps makes extensive use of Multiple Page Dialog Boxes. These dialog boxes have one or more *pages* of options that can be displayed.



The left portion of a Multiple Page dialog box displays a list of option categories (in the example above, these are Name, Description, and Physical Properties). One category in this list is always selected (in the example above, Name is selected). Click on a category to select it.

The right portion of the dialog box displays controls that allow you to change the options in the selected category (in the example above, this is the Name of Object text edit box).

For organizational purposes, options are arranged in a hierarchy. If an option category has a plus sign ✣ next to it, this means that it has one or more subpages. To display the subpages, click on the plus sign.

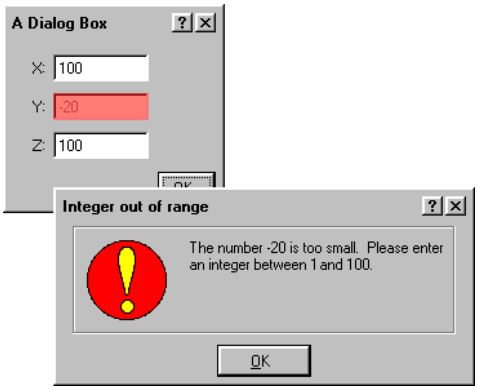


Click on the Undo Page button to discard all changes you have made to the controls on the selected page. All controls are set to the values they had when you opened the dialog box.

Click on the Cancel button to discard all changes you have made since opening the dialog box, regardless of the page.

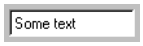
B.3. Error Messages

If an error message must be displayed, BaseOps will highlight the relevant portion of the user interface by tinting it red.



B.4. Text Control

A Text Control allows you to enter text.



It is assumed that you are familiar with using a text control. Therefore, only the functions of certain keys are listed.

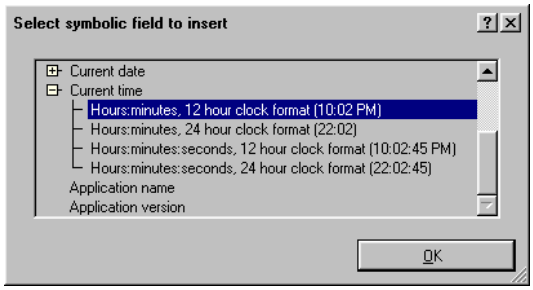
Key	Action
Shift + Arrow Key	Move the caret while selecting text
Ctrl + ←	Move one word to left
Ctrl + →	Move one word to right
Ctrl + C	Copy selected text to the clipboard
Ctrl + X	Cut selected text
Ctrl + V	Paste text from clipboard
Ctrl + A	Select all text

B.5. Symbolic Fields Text Control

A Symbolic Field Text Control allows you to enter text that contains *symbolic fields*: placeholders for information that is automatically inserted when the text is displayed. For example, in the text "You are using {AppName} version {AppVersion}", {AppName} and {AppVersion} are fields representing, respectively, the name and version of the application you are using. The text would be displayed as "You are using BaseOps version 7.365".

A Symbolic Fields Text Control is a text control with a button located to its right.

Edit the text as you would using a regular text control. To insert a symbolic field at the caret location, either press Alt + Space Bar, or press the Insert Symbolic Field button {x}. The Select Symbolic Field To Insert dialog box is displayed.



Select the symbol to insert, then press the OK button.

Note that the list of symbols is hierarchical. Click on one of the small + signs to display subsymbols. Often, these subsymbols are alternative ways of formatting the parent symbol. For example, in the screen capture of the Select Symbolic Field To Insert dialog box above, symbols for several ways of formatting the current time are shown.

B.5.1. Conditional Inclusion of Text

It is possible to conditionally include text based upon the value of a symbol. For example, suppose you are working with a weather data application that defines the symbols {Temp}, {Rain}, and {Wind}; these symbols represent the current temperature, rainfall, and wind speed, respectively. You want the temperature and humidity to always be displayed, but the rainfall to be displayed only if it is greater than zero. You can do so by using the following symbolic text:

```
Temperature = {Temp} F
{IfNotZero {Rain} Rainfall = {Rain} inches
}Wind Speed = {Wind} miles/hour
```

If the {Rain} symbol expanded to, say, 1.5, then the text would appear as...

```
Temperature = 75 F
Rainfall = 1.5 inches
Wind Speed = 8 miles/hour
```

If, however, the {Rain} symbol expanded to 0, then the text would appear as...

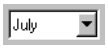
```
Temperature = 75 F
Wind Speed = 8 miles/hour
```

IfNotZero is a special command symbol that is followed by a symbol name and some additional text. If the symbol name expands to 0, then the additional text is discarded. Note that the additional text can itself contain symbols.

IfNotZero is intended to be used with symbols that expand to numeric values. There is a corresponding command, IfNotNull, that is used with symbols that expand to text — the additional text is discarded if the symbol expands to the null string (i.e., to zero-length text).

B.6. Drop-down List Control

A Drop-down List Control allows you to select a single item from a list of choices.

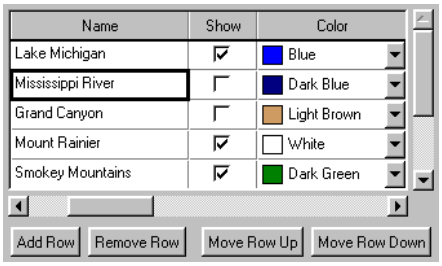


It is assumed that you are familiar with using a drop-down list control. Therefore, only the functions of certain keys are listed.

Key	Action
Letter key A through Z	Cycle through the choices beginning with that letter. For example, if you are using a drop-down list control that presents a choice of month names, pressing A will alternate the selected month between April and August.
Space Bar	Display the drop-down list
Alt + ↓	Display the drop-down list
↓	Select the next choice in the list
↑	Select the previous choice in the list

B.7. Spreadsheet Control

A Spreadsheet Control is used to enter a two-dimensional table of information.



A spreadsheet control works much like a commercial spreadsheet, such as Microsoft Excel. A two-dimensional table of *cells* is presented. One cell is always *selected*. This is indicated by a dark outline. In the example above, the Mississippi River cell is selected. The selected cell is the one that you are currently editing. The *selected row* is the row containing the selected cell.

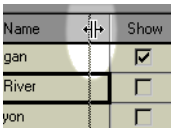
To select another cell, click on it. Alternatively, use the following navigation keys.

Key	Action
Arrow Key	Move one cell in the indicated direction
Ctrl + Arrow Key	Move one page in the indicated direction
Enter	Move one cell down
Shift + Enter	Move one cell up
Tab	Move right one cell, or to start of next row if at end of current row
Shift + Tab	Move left one cell, or to end of previous row if at beginning of current row
Page Up	Move up current column one page
Page Down	Move down current column one page
Ctrl + Page Up	Move to top of current column
Ctrl + Page Down	Move to bottom of current column
Home	Move to first column in current row
End	Move to last column in current row

Most spreadsheet controls have Add and Remove buttons. The Add button adds a new row, located just below the selected row. The Remove button removes the selected row.

Some spreadsheet controls have Move Row Up and Move Row Down buttons that move the selected row up or down in the table. Use these buttons to change the relative ordering of rows.

In most spreadsheet controls, you can change a column's width by dragging the separator between column headers.

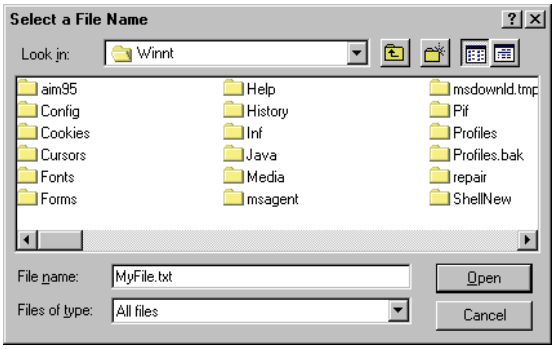


B.8. File Name Control

A File Name Control is used to enter the name of a file.

You can type the name of the file in the box provided.

To browse for the file, either press Alt + Space Bar, or press the Browse button ..., located to the right of the text box. The standard Microsoft Windows Open File dialog box is displayed.

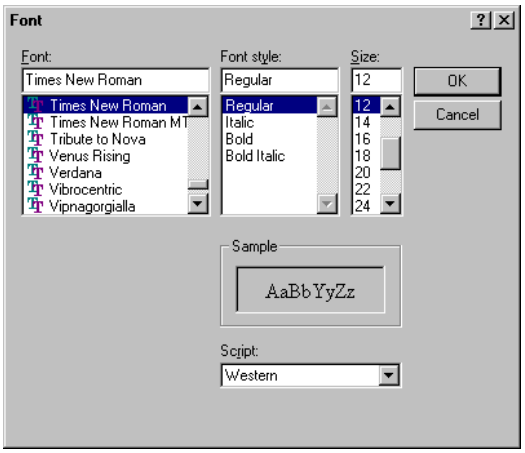


The exact appearance of the Open File dialog box will vary, depending on the version of Microsoft Windows that you are using. Familiarity with this dialog box is assumed. See your Microsoft Windows documentation for additional information.

B.9. Font Control

A Font Control is used to select a typeface font.

The current font is displayed in the box. To change it, either press the Space Bar, or press the Select Font button ···. The standard Microsoft Windows Font dialog box is displayed.



The exact appearance of the Font dialog box will vary, depending on the version of Microsoft Windows that you are using. Familiarity with this dialog box is assumed. See your Microsoft Windows documentation for additional information.

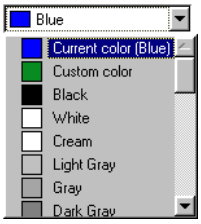
B.10. Color Control

A Color Control is used to select a color.

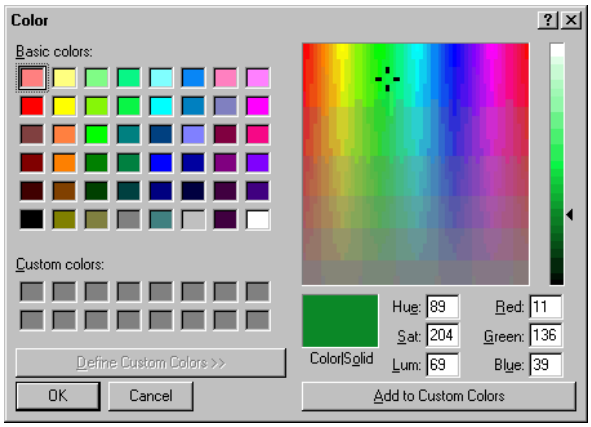
A sample of the current color is displayed in the box, followed by a name for that color. If the color is one of the standard ones recognized by BaseOps, its common name is displayed. Otherwise, the relative intensities of red, green, and blue are displayed, as in "RGB 10, 100, 255". The RGB values can range from 0 to 255.

Press a letter key, A through Z, to cycle through all colors with names beginning with that letter.

Press Alt + ↓, the Space Bar, or the drop-down button to display a drop-down list of named colors.



Select Custom Color to display the standard Microsoft Windows Color dialog box, which will allow you to pick from all possible colors.

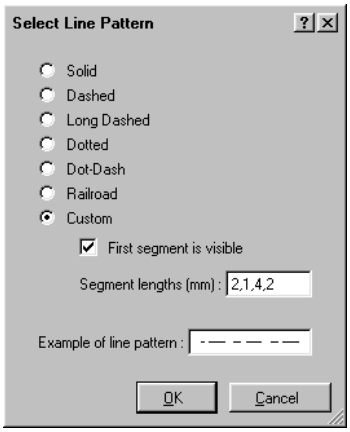


The exact appearance of the Color dialog box will vary, depending on the version of Microsoft Windows that you are using. Familiarity with this dialog box is assumed. See your Microsoft Windows documentation for additional information.

B.11. Line Pattern Control

A Line Pattern Control is used to select a line dash pattern (solid, dashed, dotted, etc.).

The sample of the current line pattern is displayed in the box. To change the pattern, either press the Space Bar, or press the Select Pattern button ... The Select Line Pattern dialog box is displayed.



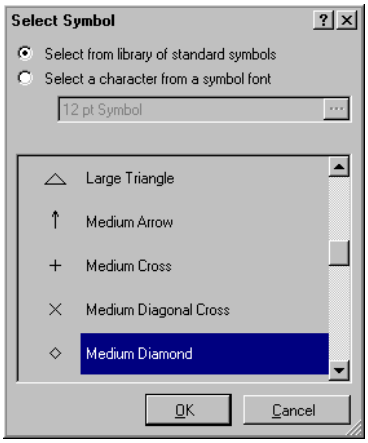
The box at the bottom of the dialog box displays a sample of the current line pattern. You can choose one of the predefined patterns, such as Solid or Dashed. Alternatively, you can select Custom, and define your own line pattern.

To define a line pattern, type a list of numbers, separated by commas, in the box labeled *Segment lengths*. These numbers are the lengths, in millimeters, of alternating line segments and gaps in the line pattern. If the *First segment is visible* box is checked, the first number represents the length of a line segment. Otherwise, the first number represents the length of a gap.

B.12. Symbol Control

A Symbol Control is used to select a graphical symbol.

The current symbol is displayed in the box. To change it, either press the Space Bar, or press the Select Symbol button ···. The Select Symbol dialog box is displayed.



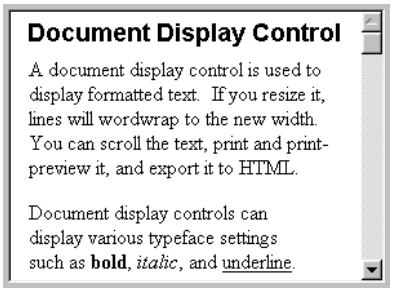
You can select from a library of standard symbols that are included with BaseOps. Alternatively, you can select a character from a symbol font.

Tip:

Symbol fonts are available from a variety of third-party sources. Some (for example, "Symbol") are distributed with Microsoft Windows. Some are available for purchase. Still others may be freely downloaded from the World Wide Web.

B.13. Document Display Control

A document display control displays formatted text.



The following keys have special functions when using a document display control.

Key	Action
↑	Scroll up one line
↓	Scroll down one line
Page Up	Scroll up one page
Page Down	Scroll down one page
Home	Go to the top of the document
End	Go to the bottom of the document
Ctrl + P	Print the document
Ctrl + W	Print preview the document
Ctrl + H	Save the document as HTML

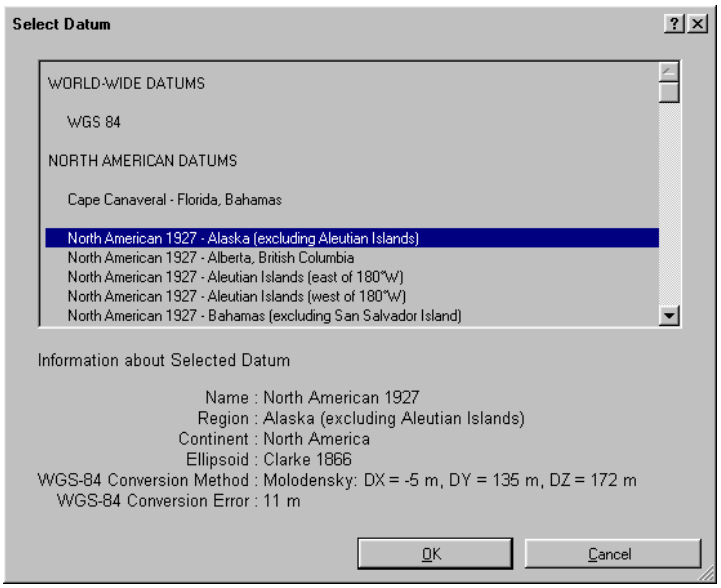
If your mouse has a middle mouse button, you can use it to scroll the document. Press and hold the middle button, then move the mouse up or down.

If your mouse has a wheel button, you can scroll the document by turning the wheel.

B.14. Datum Control

A Datum Control is used to select a geographic datum.

The current datum is displayed in the box. To change it, either press the Space Bar, or press the Select Datum button ···. The Select Datum dialog box is displayed.



The list at the top of the dialog box displays all available datums, grouped by continent or ocean (North America, Pacific Ocean, etc.). Within these groups, datums are listed alphabetically.

Below the list, the following information about the selected datum is presented:

- The datum's name
- The applicable geographic region for this datum
- The continent or ocean that contains the datum's applicable region
- The datum's reference ellipsoid
- The method used to convert between this datum and the WGS-84 datum (for the 3-parameter Molodensky transformation, the three transformation parameters DX, DY, and DZ are displayed)
- An estimate of the worst-case error when converting from this datum to WGS-84

See *Appendix E, Introduction to Datums*, for general information on datums. See *Section E.6, Default Datum*, for information about the default datum.

Tip:

Some datums are listed several times, each associated with a different area or region. For example, the "North American 1927" datum is listed 20 times: "North American 1927 - Alaska (excluding Aleutian Islands)", "North American 1927 - Alberta, British Columbia", etc. Generally, you should pick the one with the smallest associated region that completely encloses your area of interest. For example, if you are working with North American 1927 map data for the state of New York, you should select "North American 1927 - Contiguous United States east of Mississippi River" instead of "North American 1927 - Contiguous United States."

Tip:

Datums are often abbreviated using their initials and two-digit year. For example, the North American 1927 datum is commonly abbreviated as NAD-27.

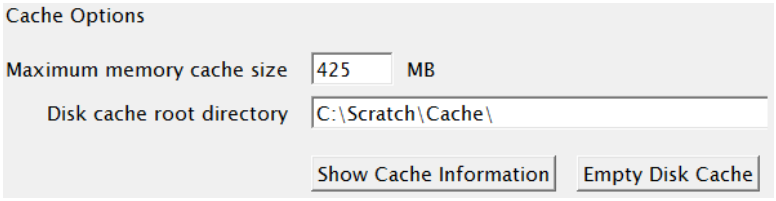
B.15. Cache Options

The cache is a portion of your computer's memory and hard disk that is used to store data for reuse. Typically, this data is either the result of a time-consuming calculation, or else is downloaded over a (relatively) slow internet connection. The cache is a performance optimization — if the data is needed again in the future, it can be quickly retrieved from the cache.

Tip:

The files in the disk cache can be deleted at any time, with no effect on the application other than the performance penalty of having to recalculate or redownload the data when it is needed in the future.

Use the Cache Options page of the BaseOps Application Options dialog box to manage the cache.



Maximum memory cache size: Enter the maximum amount of your computer's memory, in megabytes, that the cache will use. Increasing the memory cache size can result in greater performance. But it also decreases the amount of memory available for data that does not reside in the cache. If you are experiencing out-of-memory errors from BaseOps, try decreasing the memory cache size.

Disk cache root directory: Enter the directory where disk cache files will be stored. As the disk cache can grow quite large, you may want to place the cache root on a drive with plenty of free space.

Show Cache Information: Pressing this button will display the number of items and the total summed size of both the memory and disk caches.

Empty Disk Cache: Pressing this button will delete all files in the disk cache. Normally, you would not need to do this. Each disk cache file has an expiration date, after which the file is automatically deleted, so the cache will not grow without limit. But it is possible for it to grow quite large. If disk space is low, you may need to manually empty the cache.

Appendix C

Description of BaseOps Files

C.1. Files Shipped With BaseOps

The following files are distributed as part of BaseOps. Do not modify any of these files, as they will be overwritten when later versions of BaseOps are installed.

- **BaseOps.exe** - The BaseOps application.
- **BaseOps_VersionHistory.txt** - A text file recording the released versions of BaseOps.
- **Standard Flight Profile Library - BaseOps.baseops** - The library of standard flight profiles. See *Section 18.7, The Standard Profile Library*, for more information.
- **Default.MapFormattingScheme** - Controls the colors, line styles, etc. used to display Digital Line Graph (DLG) maps. See *Section 9.2.1, Map Formatting Schemes*.
- **Documentation*.*** - The `Documentation` subdirectory contains the BaseOps User's Guide, stored in XML format.
- **Tutorial*.*** - The `Tutorial` subdirectory contains files supporting BaseOps' tutorials.

C.2. Files Created by BaseOps

The following files are not included in the BaseOps distribution package, but may appear after running BaseOps.

- **BaseOps.cfg** - Contains application-wide BaseOps configuration information. An example of the type of information stored in this file is the last size and location of many dialog boxes. If this file is deleted, all options will return to their default values.

- **BaseOps.log** - Log of debugging, error and warning messages from the last time BaseOps was run.

- **BaseOps Fatal Error Report.txt** - A report containing debugging information for the last fatal error experienced by BaseOps. This file may contain information allowing the cause of the error to be determined.

The following files are not included in the BaseOps distribution package, but will appear if you perform certain actions while running BaseOps.

- **Standard Flight Profile Library - User.baseops** - The library of user-defined standard flight profiles. This file will be created the first time you save a standard flight profile. See *Section 18.7, The Standard Profile Library*, for more information.

C.3. Other Noisemap Files

BaseOps is distributed as part of Noisemap. Many of the Noisemap subdirectories contain a `ReadMe.txt` file that describes the files in that directory.

The `NMPlot` directory contains the NMPlot plotting application. See the NMPlot User's Guide for a list of NMPlot files.

The `Cases` directory is the default place where new BaseOps cases are created. Several sample BaseOps cases are distributed with Noisemap.

Appendix D

Command-Line Options

The name of a BaseOps case file may be specified on the BaseOps command line. This file will be opened when BaseOps runs. This allows you to associate the extension `.baseops` with the BaseOps application, and invoke BaseOps by double-clicking on a case file from Microsoft Windows Explorer.

An old-format case file (i.e., a file with the extension `.ops`, `.opx`, or `.bps`) may also be specified on the command line. If a corresponding `.baseops` file exists (i.e., a file with the same base name, but with an extension of `.baseops`), it will be opened. Otherwise, a new `.baseops` case file will be created from the existing file.

Enclose file names containing spaces with double-quotes, as in...

```
C:\>baseops "My Case File.baseops"
```

D.1. Create Noise Model Input Files

D.1.1. Synopsis

-makeopx *baseopscasefilename*

D.1.2. Description

Creates all relevant noise model input files for a BaseOps case. This includes the `.ops` and `.opx` files for NMap, the `.ops` files for AAM and RNM, and the `.ins` and `.inx` for MRNMap. If the BaseOps case contains multiple scenarios, then distinct input files are created for each scenario.

The effect is the same as if you manually performed the following steps.

1. Start BaseOps and load the case file
2. Go to the Run page
3. Choose to Run All Scenarios
4. For the run steps to perform, select Run Only The Following Steps
5. For each noise model, check those steps up through the creation of the relevant `.opx`, `.opx`, and `.inx` files, and uncheck all subsequent steps
6. Run the case
7. Change all of the run options back to the original values they had when the case was loaded
8. Exit BaseOps

D.1.3. Examples

```
C:\>baseops -makeopx "My Case File.baseops"
```

D.1.4. Comments

This command line is intended to be used as part of a batch operation. BaseOps will exit after creating the relevant noise model input files. See *Section D.2, Batch Mode Error Handling*, for a discussion of how errors are handled while processing this option.

D.2. Batch Mode Error Handling

The following command-line options cause BaseOps to open, perform a task, and then shut down.

- **`-makeopx`**

These options are typically used when BaseOps is being run from a script or as a child process of another application. In this situation, BaseOps enters *batch mode*, which causes errors to be handled differently. Instead of an error message dialog box appearing, BaseOps writes the error message to a text file and then exits.

If an error does not occur, BaseOps deletes the error message file if it exists. Therefore, after BaseOps exits, the calling script or application can determine if an error occurred by checking for the existence of this file. If the file exists, it will contains a description of the error that occurred.

By default, the error message file is located in the BaseOps home directory (i.e., the same directory as `BaseOps.exe`), and is named `BaseOpsBatchErrorFlagFile.txt`. If desired, you can specify another name using the **`-BatchErrorModeFlagFile`** command-line option. This option should be followed by the desired error message file name.

Important:

If your script or application will be simultaneously running multiple instances of BaseOps, it is strongly suggested that you use **`-BatchErrorModeFlagFile`** to specify a different error file for each instance.

In addition to the error file, BaseOps also uses a non-zero return code to indicate that an error occurred.

Appendix

Introduction to Datums

E

E.1. What is a Datum?

A datum is a detailed survey of a country, continent, or some other portion of the Earth's surface. As part of the survey, the longitudes and latitudes of a large number of points are measured using the best available methods. Once the survey is complete, maps of the region can be constructed.

Over time, the accuracy of surveying methods has steadily improved. Therefore, most regions of the Earth of been surveyed many times, with increasingly accuracy. Each of these surveys is referred to as a datum. With each new datum, the longitude and latitude of a given point on the Earth will change. This change can be as large as several hundred meters.

E.2. Why are Datums Important?

Adopting a new datum is expensive. Maps must be reprinted. Data files must be converted. Computer programs must be modified. Therefore, at any given time, more than one datum will likely be in use for a given region.

For example, in the United States, both the North American Datum of 1927 (NAD-27) and the World Geodetic System of 1984 (WGS-84) are in widespread use. In addition, maps and data in numerous lesser-used datums are also available.

For this reason, longitude and latitude alone are insufficient to describe the location of a point with an accuracy better than a few hundred meters. If greater accuracy is required, another piece of information is needed: the datum.

 ***Note:***

Even if you are certain that all of your data and maps are in a single, consistent datum, you still may need to know what that datum is. For example, the datum is required in order to convert from Universal Transverse Mercator (UTM) coordinates to longitude and latitude. This is because the conversion depends on the ellipsoid (a mathematical model of the Earth's shape), and the ellipsoid is part of the datum.

E.3. Doesn't WGS-84 Solve the Datum Problem?

Most datums are local, intended to be used for only a portion of the Earth's surface. However, in recent decades, improved surveying techniques have enabled global datums to be established. These datums can be used to accurately map the entire Earth.

The most recent, and most accurate, datum is the World Geodetic System of 1984 (WGS-84). While future improvements in surveying techniques may result in modifications to this datum, these are expected to be minor: the coordinates of locations should shift by only a few centimeters. Therefore, for most practical applications, WGS-84 represents the ultimate datum.

Once all maps and data are converted to WGS-84, the problems associated with multiple datums will disappear. Therefore, mapping organizations throughout the world are converting to WGS-84.

Unfortunately, the goal of a single global datum has not yet been attained. Converting to a new datum is expensive and time-consuming. Therefore, the conversion to WGS-84 is proceeding slowly, and may take decades. Certainly for the foreseeable future, the existence of multiple datums will be a reality. Anyone who works with geographic data must be prepared to deal with this fact.

E.4. How BaseOps Converts Between Datums

BaseOps can convert between most common datums. The 3-parameter Molodensky transformation is used for this purpose. Transformation parameters were taken from *Department of Defense World Geodetic System 1984—Its Definition and Relationships with Local Geodetic Systems*, NIMA Technical Report TR8350.2, Third Edition, Amendment 1, 3 January 2000.

E.5. Recommendations

If errors of several hundred meters are acceptable, you can ignore the entire issue of datums. However, if you require greater accuracy, then you must know the datum of any geographic data you use.

Whenever you obtain geographic data (maps, computer files, tables of locations), make sure that you determine the datum of that data. For maps, the datum can often be found printed in the legend area of the map. For computer files, the datum is often listed in the accompanying documentation. If you cannot determine the datum, ask your source. Any reputable source of geographic data should be able to supply this information.

Similarly, whenever you supply geographic data to others, make sure you tell them the datum. Include the datum in any documentation you provide.

If you are working with computer programs that process geographic data, insure that you know how those programs handles datums. Some programs (such as BaseOps) allow you to specify the datum of your data. Others require that all data be in a fixed datum. Consult the program's documentation.

If you are working with a global positioning system (GPS), make sure you know the datum that your GPS displays locations in. Many allow you to select the display datum.

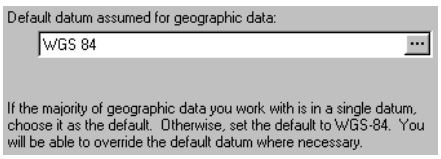
If you absolutely cannot determine the datum of your data, then WGS-84 should be assumed. However, be aware of the potential errors if this assumption is incorrect.

E.6. Default Datum

In BaseOps, you can set a *default datum* that will be assumed for all geographic data unless you specify otherwise.

If the majority of the geographic data that you work with is in a single datum, choose it as the default. Otherwise, set the default to WGS-84. You will be able to override the default datum where necessary.

To set the default datum, choose Application Options from the Tools menu, then go to the Default Datum page of the Application Options dialog box.



See *Section B.14, Datum Control*, for information about the datum control, which you use to specify the default datum.

Appendix

Contacting Wasmer Consulting

F

BaseOps was developed by Wasmer Consulting, a software development firm specializing in scientific and engineering applications. Since 1989, Wasmer Consulting has been developing products with an emphasis on quality and usability.

Wasmer Consulting welcomes your comments about BaseOps: both reports of problems and suggestions for future enhancements.

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